KENTUCKY SMILE CURRICULUM

An oral health education manual

This document was developed through a cooperative effort between The University of Kentucky College of Dentistry, The Kentucky Cabinet for Human Resources and The Kentucky Oral Health Consortium.

UNIVERSITY OF KENTUCKY
A Tradition of Value
College of Dentistry

KENTUCKY CABINET
FOR HUMAN RESOURCES

KOHC
Kentucky Oral Health Consortium

ACKNOWLEDGMENTS

Colorado Department of Health

Kentucky Cabinet for Human Resources
Dental Health Program

Kentucky Oral Health Consortium

New Jersey Dental Health Program

University of Kentucky
College Of Dentistry
Public and Professional Services Program

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for desktop publishing

PREFACE

Curriculum Section

SMILE is an oral health education manual for use for teachers in Kentucky. These materials have been developed on the premise that students and teachers have a common interest in learning interesting information about their own teeth and about dentistry in general.

The University of Kentucky, College of Dentistry; the Cabinet for Human Resources Dental Program and the Kentucky Oral Health Consortium, Inc., reviewed a number of dental educational programs and decided not to "reinvent the wheel," but chose to revise and update the best materials currently available. The basics of the *SMILE* program was originally published under a different name as a joint project of the Utah Department of Health and Utah State University and later by the New Jersey Dental Health Program.

The primary goal of *SMILE* is to assist students in developing awareness, knowledge and attitudes that will result in responsible behavior with respect to their dental health. This goal is approached by providing the teacher with suggested learning activities and relating each activity to a specific program topic and objective. The overall purpose of this manual is to provide, in a single source, accurate dental health education material for those who do not teach dental health on a regular basis.

Teachers are encouraged to adapt these activities freely to meet their particular needs. We solicit your support of this opportunity for all school children in Kentucky to learn more about good oral health practices.

Dental First Aid Section

The last section of this manual deals with dental first aid. It places special emphasis on the important role of the school nurse in the early assessment and care of dental emergencies which occur to students during school hours. The school nurse may remove the dental first aid section and have it available for easy reference. The remaining portion of the manual should then be given to an appropriate individual in your school.

HOW TO USE THIS BOOK

As a Supplement to Existing Courses

Instructional activities within *SMILE* are designed for easy integration into the existing curriculum framework for health education. Teachers may use this text to satisfy all dental health related standards in the health core. The materials in this book go beyond minimum competencies and provide interesting and enriching experiences for all grade levels.

Organization of the Materials

Teachers may pick and choose the activities because they are designed for integration into existing school curriculum. Activities generally are designed to stand alone, however, they may be assembled into a series of activities or even units. It is not necessary to complete all activities for a given grade level, nor are the activities in the book presented so that you would start with the first activity and proceed though the book.

The activities are organized in sections corresponding to major topics and are keyed to a curriculum framework. By looking at the table of contents, or reading the curriculum framework, you can note the conceptual development of the manual - from the basics of getting familiar with the mouth to a more in-depth awareness of the dental profession.

Organization of Each Topic

Each section begins with background information which is intended to provide content background for the teachers. This is not intended to be exhaustive, but rather only to provide some knowledge for the teacher. Some activities will refer the teacher back to the content section.

Each activity includes a curriculum framework reference, a title, intended grade level and a materials/preparation section. The materials for the activity have purposely been kept simple and inexpensive.

The procedure section includes a brief description of suggested methods that can be employed for each activity. For most activities, there are also extensions that go beyond the basic activity level.

This text is written in grade level format. This can be translated to an age-appropriate level, but is not intended to be used strictly by grades designated.

Photocopying of worksheets, charts, puzzles and handouts

Individual worksheets will need to be photocopied for every student prior to their use. It is important to note that some worksheets have two activities on the same page. Activities which you are not planning to use can be blocked out when the worksheets are photocopied.

Appendices

The three appendices includes a glossary of terms for use by the instructor, information about programs sponsored by the Kentucky Cabinet for Human Resources Dental Health Program and a comprehensive section regarding dental first aid information for school nurses.

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Program Goal 1.0:

To provide a general understanding of what may be found in the mouth.

Topic 1: The parts of the mouth.

Objective: The student will describe the functions of the major parts of the mouth.

Program Goal 2.0:

To develop an understanding of structure and function of teeth.

Topic 2: Tooth Development

Objective a: The student will describe the development and function of both primary and permanent teeth.

Objective b: The student will describe tooth structure and functions.

Program Goal 3.0:

To develop an understanding of tooth problems and how to prevent or alleviate these problems.

Topic 3: Tooth Decay

Objective: The student will describe the influence plaque has on the teeth.

Topic 4: Preventing Decay Problems

Objective a: The student will conclude that nutrition and eating habits may influence tooth decay.

Objective b: The student will identify fluoride and sealants as the most effective agents in preventing tooth decay.

Topic 5: Preventing Periodontal Diseases

Objective a: The student will investigate the influence of brushing and flossing in preventing periodontal disease.

Objective b: The student will conclude that brushing and flossing are effective in preventing periodontal disease, will save money and prevent tooth problems over the long run.

Topic 6: Nutrition

Objective: The student will identify foods which are good for the teeth and body.

Topic 7: Smokeless Tobacco

Objective: The student will infer from class discussion the effect of smokeless tobacco on oral health.

Topic 8: Malocclusions

Objective: The student will recognize and describe malocclusions.

Topic 9: Accidents

Objective a: The student will describe actions to be taken in the event of a tooth injury.

Objective b: The student will identify ways of preventing accidental tooth injuries.

Program Goal 4.0

To put today's dentistry into historical perspective.

Topic 10: Dentistry Yesterday, Today, and Tomorrow

Objective a: The student will develop an appreciation for dental history.

Objective b: The student will develop an appreciation for modern dental practices and procedures.

Program Goal 5.0:

To develop an understanding of the importance of dental professionals.

Topic 11: Dental Professionals

Objective a: The student will recognize dental professionals as a source of help in solving tooth problems.

Objective b: The student will conclude that the dental health team can help prevent many future problems.

TOPIC ONE

The Mouth

Program Goal 1.0: To provide a general understanding of what may be found in the mouth.

Background Information

The mouth is the beginning of that long passageway through the body called the digestive tract. It can be thought of as a hinged box bounded on the top by the hard palate (Figure 1), in the back by the soft palate, on the sides by the stretchy cheeks, and on the bottom by the tongue. The lips form the front of the box and provide the opening into the box.

The mouth is lined with cells that are similar to skin cells but are not as strong as skin cells. They do contain nerve endings that respond to heat, pain, pressure and temperature just as skin cells do. The mouth is the only part of the digestive system that is so equipped.

The mouth opens at the back into the pharynx, an area shared by both the respiratory and digestive systems.

The tongue is needed for speech, aids in swallowing and contains nerve endings that provide the sense of taste. The tongue is a bundle of muscles that can be moved in many directions. Close examination of the tongue will reveal many small projections called papillae. The taste buds are concentrated in these papillae.

Teeth aid in speech and are the primary agents used to break food into smaller pieces. This process, called mastication, is important as it breaks up food particles and allows digestive juices to act on the food more efficiently.

The process of mastication is helped by saliva which is formed and secreted by the salivary glands in the mouth. Saliva softens and lubricates the food mass so that food can be more easily chewed and swallowed. Saliva also dissolves some of the food so that it can be tasted and initiates chemical digestion by changing starch to sugar. Saliva helps wash the teeth and neutralize the mouth acids which forms when sugar breaks down. This washing and cleaning helps protect the tooth enamel from the dissolving action of natural acids.

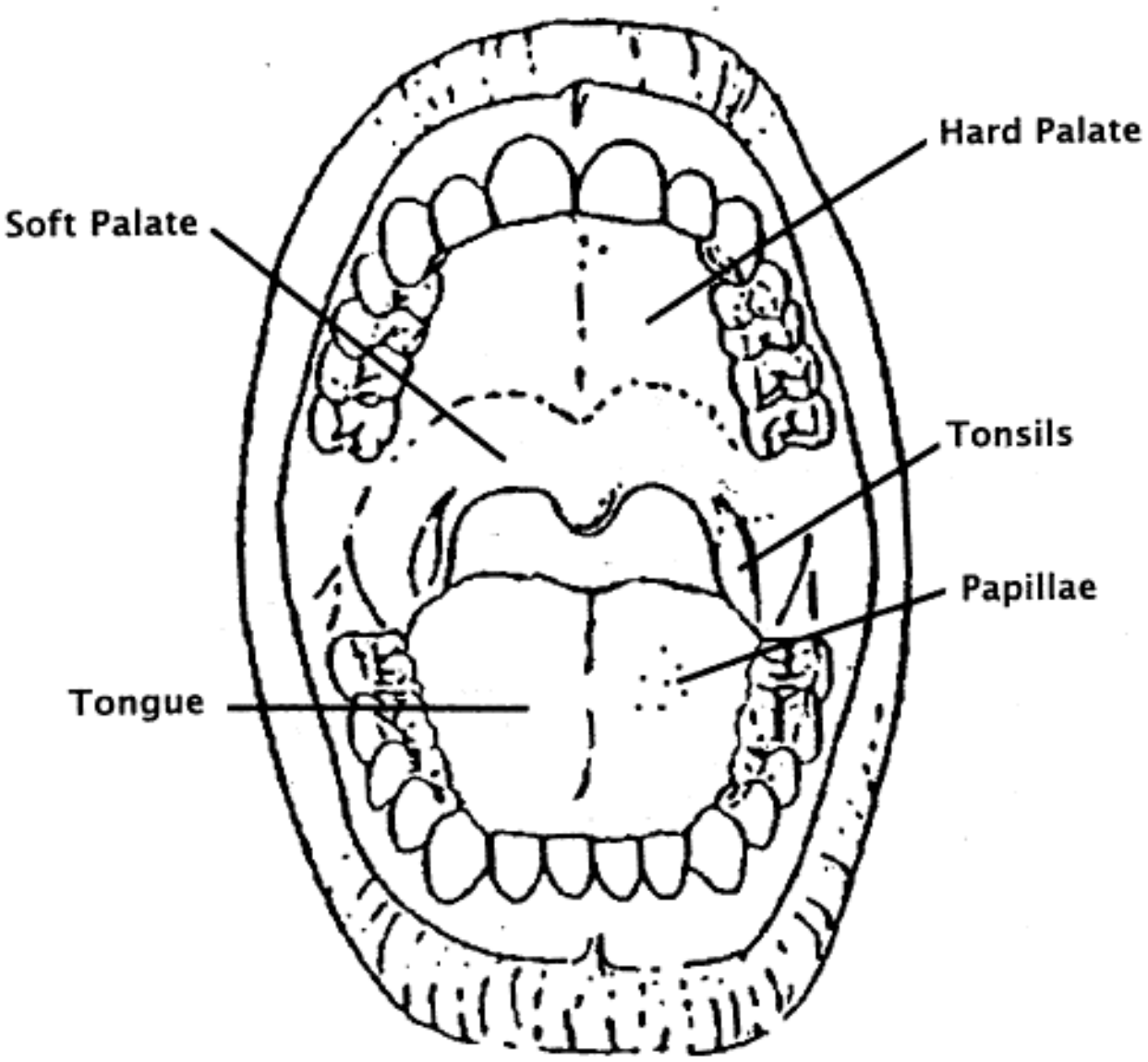


Figure 1. The Mouth Cavity

I-A. TOOTH FOR EVERY OCCASION

Objective: The student will describe the functions of the major parts of the mouth.

Grade Level: K-2

Materials/Preparation:

Magazines
Scissors
Crayons
Popcorn

Procedures:

1. Begin the activity by asking the students what they like to eat for dinner. List the foods on the chalkboard. After assembling a good sized list, discuss what happens to each food while in the mouth. Erase all the foods that need to be chewed. Conclude the discussion by establishing the importance of teeth in eating.

2. Distribute magazines and scissors. Tell the students to find one or more pictures of people that have teeth they can see. Ask the students to blacken the teeth in one picture. Discuss the effect teeth have on appearance.

3. The tongue and teeth are used to help make sounds. As the class says the alphabet in unison, have them raise their left hand each time the tongue touches the teeth to make a sound and raise their right hand each time their lips close to make a sound. Use two students to count each type of event and record the results on the chalkboard.

4. Instruct the students to "explore" their teeth with their tongue. Have them describe how the teeth are different or alike. How do they change from the front to the back of the mouth? Why are they different? Distribute a kernel of corn to each student. Instruct them to chew it with their front teeth. Why are the teeth different from front to back?

Extensions:

1. Invite a local or school speech therapist to share information with your students on the importance of teeth in making sounds.

I-B. A MOUTH FOR EVERY OCCASION

Objective: The student will describe the functions of the major parts of the mouth.

Grade Level: 1-2 **Materials/Preparation:**
None

1. Begin the activity by asking students to name reasons for having a mouth. List the responses on the chalkboard.

2. For each reason listed, attempt to identify the parts of the mouth that are used. For example: kissing-lips. Be sure to include: **CHEEKS, LIPS, TEETH, JAW, TONGUE, MUSCLES.**

3. Conclude the activity with a smile contest. Have students line up six at a time and give their best smile. Have the remainder of the class vote for the best smile. Repeat this procedure until everyone in the class has had a chance to smile. Then have the winners from each group compete for "grand smile." Discuss reasons why smiles look good. Emphasize the role teeth play in appearance.

Extensions:

1. Cut out pictures of people with beautiful smiles for a bulletin board display.

I-C. DENTAL TONGUE TWISTERS

Objective: The student will describe the functions of the major parts of the mouth.

Grade Level: 2-6 **Materials/Preparation:**
None

Purpose:

The purpose of this activity is to present dental health in a fun and interesting way. It can also be used when the students get restless and need a short break or a change in their activities.

Procedures:

1. Have the students hold their tongue in one position, i.e., on the roof or the floor of their mouth and have them repeat the tongue twisters. (They will probably get a lot of laughs from the funny pronunciations that come out of their mouths, but use this opportunity to teach phonics and the relationship between teeth and speech.)
2. Combine this activity with an art project by having the children illustrate the tongue twisters or by having them make hand puppets of the characters.
3. Have your students try finding the hidden dental message found in these tongue twisters. For example, the "Fanny Floss" tongue twister uses the words floss and fluoride, so a hidden message could be, "For good dental health you must floss your teeth and use fluoride every day." You might have to stretch your imagination, but never-the-less a message can be found.
4. Use these tongue twisters whenever the children are restless and need a change of pace.
5. Have your students make up their own tongue twisters and present them to the class. (Remember, tongue twisters are supposed to be silly and don't always need to make sense.)

Here are several fun tongue twisters

Ann Anteater ate Andy Alligator's apples and angry Andy Alligator ate Ann.

Dippy Dan's dentist didn't dare dunk donuts.

Doesn't Doctor Dilly know dental deals with dentition?

Fanny Floss felt frustrated for forgetting Freddie Felt's fluoride.

Fruity flavored fluoride fights fillings.

Mouthy Martha melted marshmallows in her mouth.

Slurpy Sam Sloppily slurped a soft, sugary soda.

Tough tacky taffy takes teeth from Tilly Tattle Tooth.

TOPIC TWO

Tooth Development

Program Goal 2.0: To develop an understanding of structure and function of teeth.

Background Information

All mammals, including humans, have two sets of teeth. The first set begins to appear within a few months after birth. They are replaced by a set of permanent teeth that remain for the rest of a person's life. The first set, the primary or deciduous teeth, begin to form some months before birth. The buds for some of the permanent teeth are also formed in the tissues of the jaw before birth. The approximate ages at which the various teeth appear is illustrated in Figure 2.

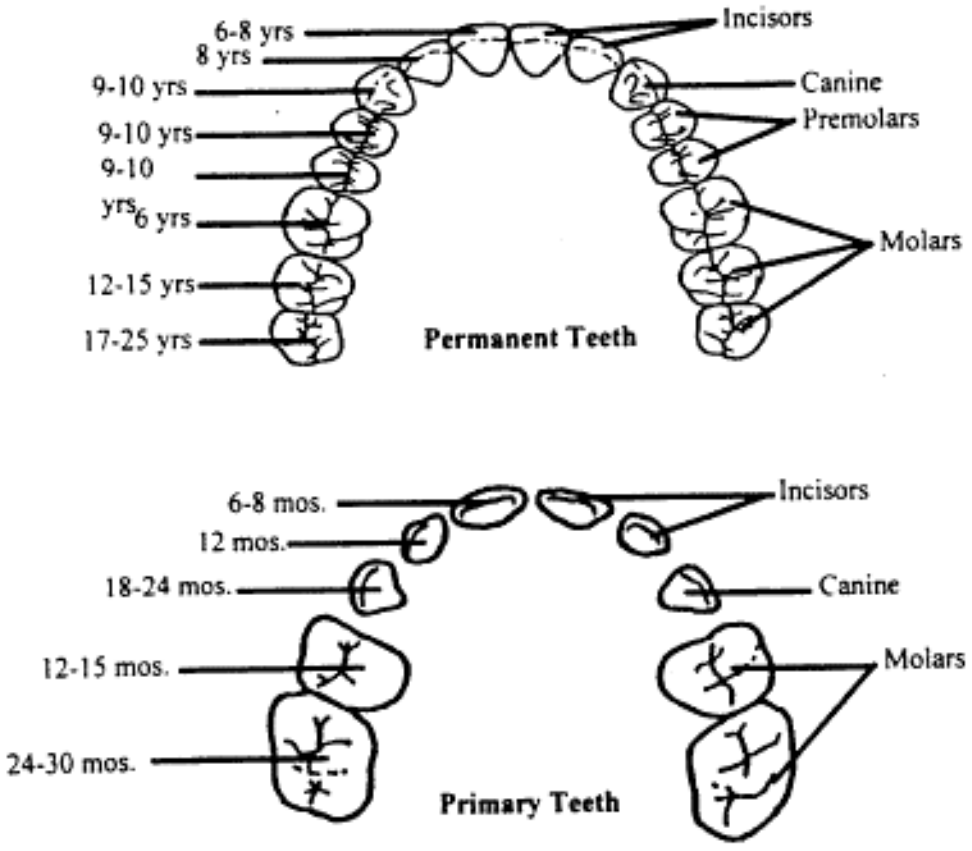


Figure 2. The types of teeth, their arrangement, and ages at which they appear.

When a tooth emerges through the gum, it is said to erupt. In the case of primary teeth, this is often a source of discomfort for the young child. The eruption may irritate the gums and cause increased salivation. The eruption of the permanent teeth, with the occasional exception of the molars, usually does not involve the same problems.

Figure 3. A radiographic illustration of the eruption process.

The second set of teeth does not push the earlier set out of their sockets, as many people believe (Figure 3). As the new teeth grow within the jaw, groups of special cells form at the top of the new teeth. These cells dissolve the roots of the primary teeth.

Normally there are a total of 20 primary teeth and 32 permanent teeth. They are categorized by function such as incisors for biting, cuspids (eye teeth) for tearing, premolars (bicuspids) for crushing and molars for chewing. The last of the molars to appear at about 18 years of age are called wisdom teeth or third molars.

During the formation of the tooth, two separate tissues add to its structure (Figure 4). The enamel is formed by specialized epithelial cells. Another group of cells produces the dentin. Both of these hard tissues are formed in a manner similar to the process that forms bone. The enamel is made up of microscopic hexagonal rods that are cemented together, similar in form to a bundle of pencils, with the ends exposed at the enamel surface.

The enamel covers the crown of the tooth and goes a little below the gum line. The dentin lies under the enamel and makes up the bulk of the tooth. It is softer and more porous than enamel. Within the tooth socket, the root is surrounded by a periodontal membrane which is attached by fibers to the lower jaw bone (mandible) and cushions the tooth during chewing.

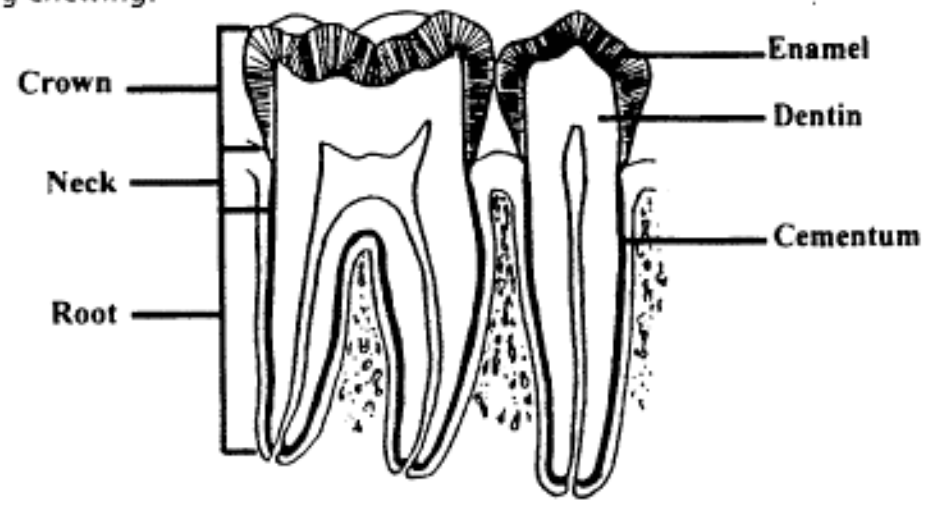


Figure 4. Cross section teeth showing tooth structures.

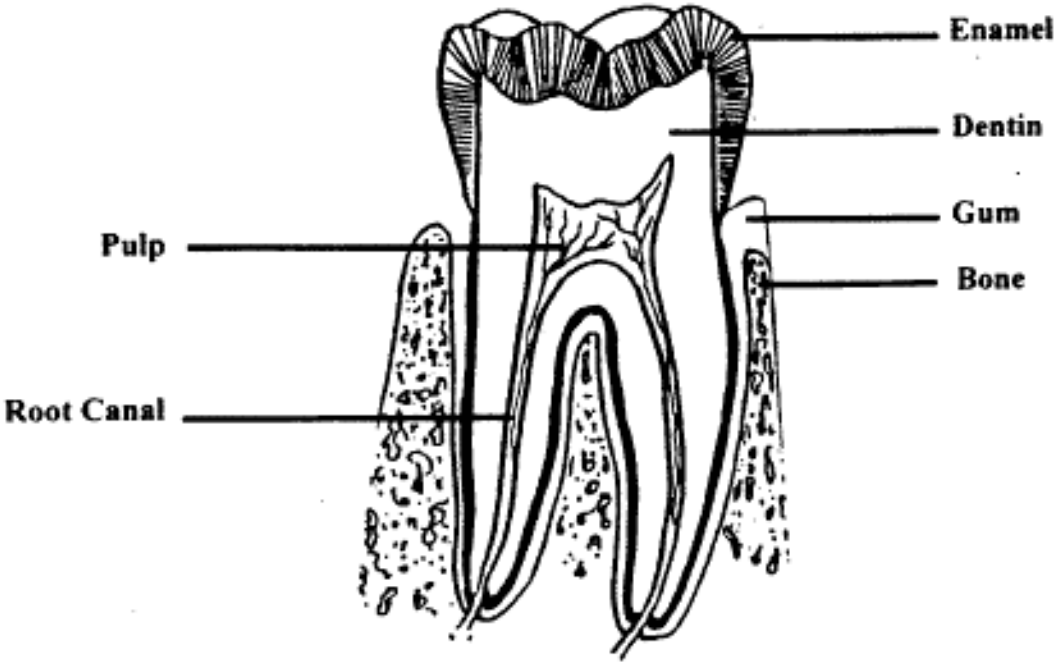


Figure 5. Cross section of a tooth.

The tooth is nourished by blood vessels and nerves found in the pulp cavity. When bacteria and acids first enter the pulp, part of the pulp becomes infected (figure 6a). If the tooth is not treated, the infection destroys the dentin and more bacteria enter the pulp (figure 6b), resulting in an abcess

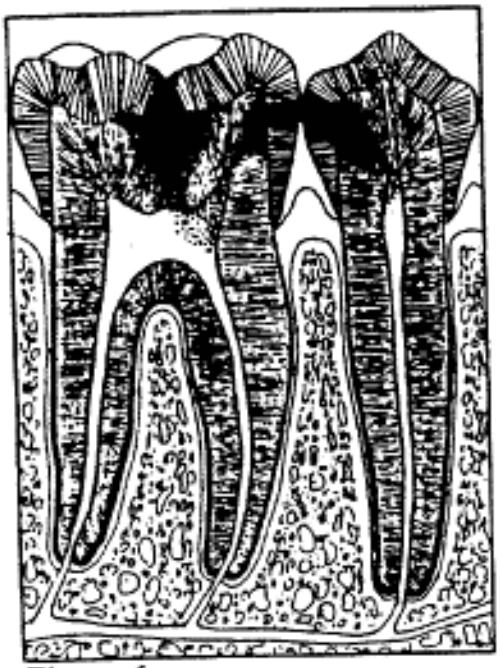


Figure 6a.

Figure 6b.

Figure 6. Entry of a carious lesion into the pulp cavity.

The main function of the teeth is chewing. Chewing is really a very complicated process. The teeth must be of the right shape and be properly aligned in the jaws so that the movements of the lower jaw will bring the opposing teeth into the proper relationship with each other for efficient chewing.

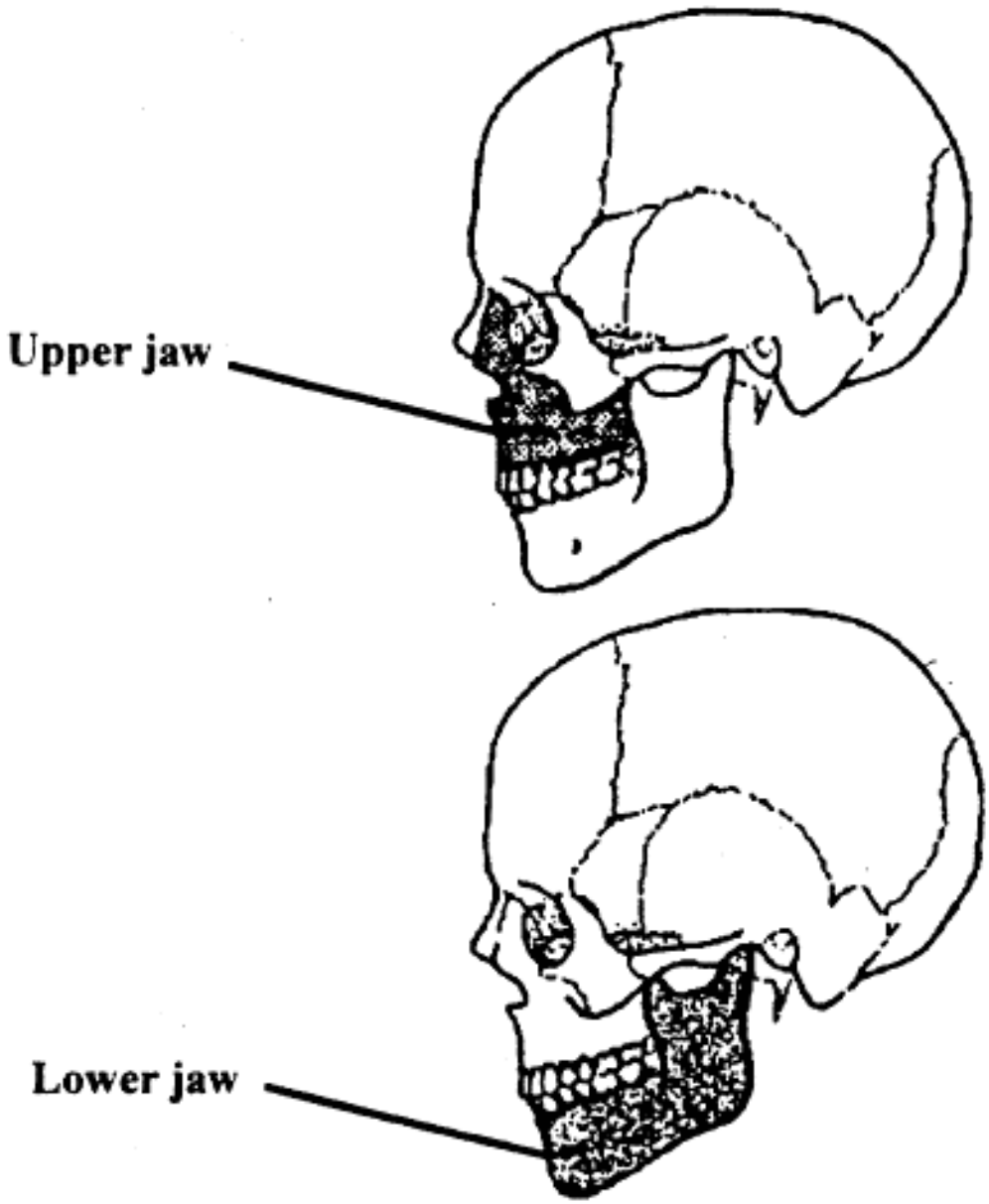


Figure 7. Shaded areas of aligned upper and lower jaw.

2-A. MIKE MOLAR

Objective: The student will describe the development and function of both primary and permanent teeth.

Grade Level: K-2

Materials/Preparation:

1/2 yard of an old white sheet
1/2 yard 35-inch white flannel or flannelette
stuffing material (hosiery)
white thread
assorted colors of felt

Mike is a three-dimensional tooth made of flannel. Facial features are cut out of felt. If the three-dimensional tooth is not available, cut a flannel tooth with appropriate facial features. This can be mounted on cardboard and will work as well.

Procedures:

1. Cut two pieces of white sheet in the shape of a molar tooth, approximately 20" x 13".
2. Sew these pieces together, leaving the top surface (occlusal) open for stuffing.
3. Stuff with stuffing material.
4. Fold the top like a package and stitch.
5. Cut two pieces of flannel the same size and shape as the sheets and sew together, leaving the top open.
6. Slip flannel over "Mike" and baste closed like a package. (This outer covering can be removed for easy laundering.)
7. Cut parts of face from assorted colors of felt.
8. Make up a story about Mike Molar.

2-B. WOULD YOU KNOW A TOOTH IF YOU SAW ONE

Objective: The student will describe the development of both primary and permanent teeth.

Grade Level: 1-2 **Materials/Preparation:**
Worksheet (Page 21)

Procedures:

1. Introduce the activity by talking about teeth that have come out. Have older brothers or sisters lost more teeth? Why do you think they come out? Introduce the terms: PRIMARY and PERMANENT TEETH. Use the background information section as a reference for information to share with the students. Adapt the concepts to the abilities of your students.
2. Distribute the "Parts of a Tooth" worksheet. Introduce the terms: BONE, CROWN, ROOT AND GUM. Label the tooth and fill in the blanks.

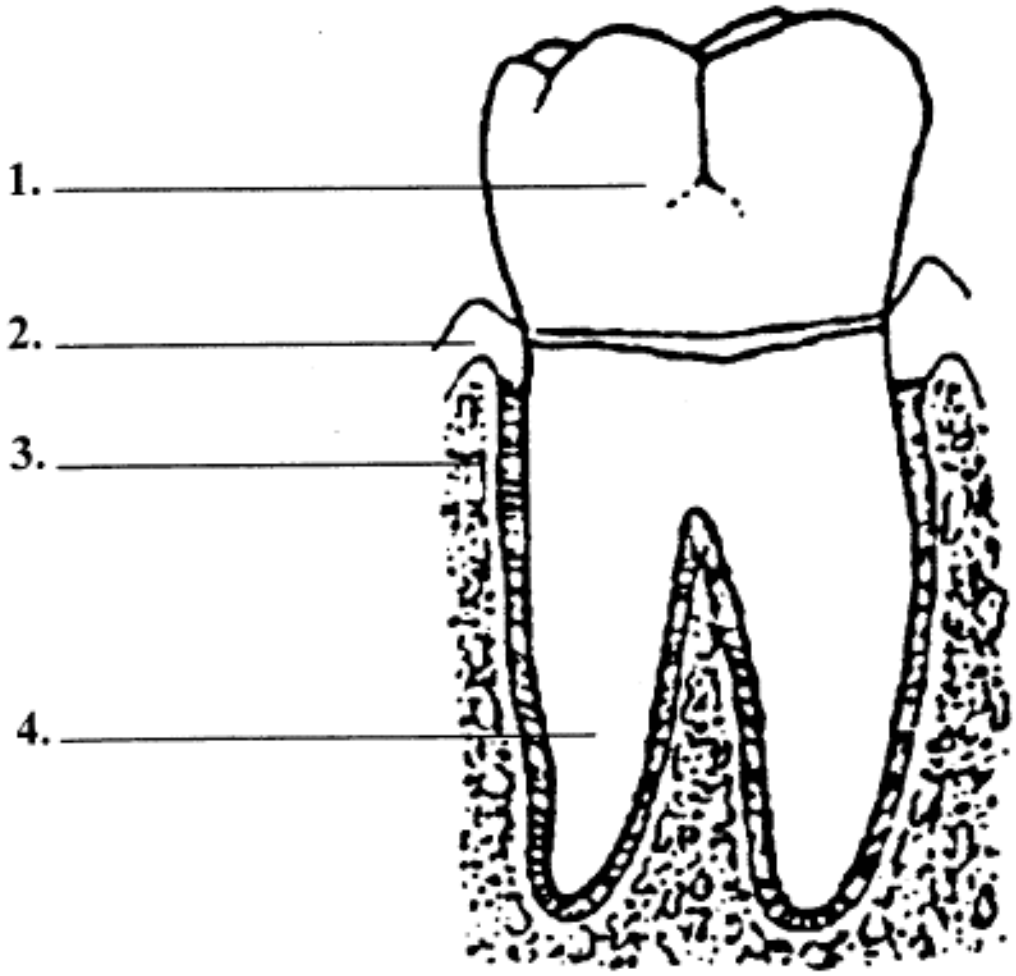
Extensions:

1. Have a show and tell session on the topic, "When I lost my first tooth."
2. Make up a story about, "The person whose teeth would not stop growing."

WORKSHEET: Parts Of A Tooth

NAME: _____

Correctly label the following parts of this tooth: **bone, crown, gums, root.**



FILL IN THE BLANKS BELOW

bone **crown** **gum** **permanent** **primary** **root**

1. The first set of teeth we get are called _____ teeth.
2. The part of a tooth we can see in the mouth is the _____ .
3. The hard part of the tooth that holds the tooth tightly in place is the _____ .
4. The soft pink material that grows around our teeth is called the _____ .
5. The last set of teeth we get are called _____ teeth.

2-C. VEGETABLE CARVING ACTIVITY

Objective: Student will describe tooth structure and functions.

Grade Level: 5-6

Materials/Preparation:

Large potato
Large carrot
Dull carving instruments (use with great care!)

Procedures:

There are different ways that this activity can be used, either of which could be fun for your students.

1. Have your students carve a tooth from a peeled potato. Pre-carving preparation should include a discussion on the structure and shape of the tooth. (You might want to put a picture of a tooth on the board to help your students remember what a tooth should look like.)
2. Use a potato or carrot to do some block printing of a dental message or to make a simple picture (i.e., tooth, toothbrush, dentist, dental floss, etc.) Here the potato works like a rubber stamp. If the students want the picture to be inked with no background, then have them carve the potato so the picture is raised. If they want the picture outlined then have them indent it. (If liquid dishwashing detergent is mixed with the Tempura paint, the clean up will be easier.)

Concepts to Teach:

1. Tooth Structure
   A. The enamel of a tooth is hard and firm. It is the hardest part of the body.
   B. If proper care is taken teeth can last an entire lifetime.
   C. When teeth first appear in the mouth they are usually unblemished by dental disease. Dental disease occurs through neglect.

Suggestions for Using this Activity

1. Potato Carving

Teach the students that their potato tooth is hard, firm and without any blemishes when it is first peeled. If it is left for a few days it will get soft and brown until eventually it is ugly and useless. Relate this to a tooth where proper care is not taken, which eventually becomes susceptible to decay and is ruined if not treated in time by a dentist. Fortunately, cavities can be prevented with the investment of time and effort.

2. Block Printing
   A. An English, dental and art activity can be combined with this project. Have the class make up a dental story using the potato characters they carved, and then use these characters to illustrate the story.
   B. Another possibility is to invite the parents to a class party where good dental snacks will be served. Have the children use their potato carving to make the cover for the invitation. It might be fun to use the same idea to make similar invitations for back-to-school night or parent teacher conferences, etc. (This activity could be used at all grade levels.)

TOPIC THREE

Tooth Decay

Program Goal 3.0: To develop an understanding of tooth problems and how to prevent or alleviate these problems.

Background Information

Plaque is a soft, sticky, colorless layer of bacteria and bacterial by-products that is constantly forming on the teeth. Acids and irritants produced by the bacteria in plaque are recognized to be the primary causes of the two most common dental diseases: dental caries and periodontal disease. Everyone has plaque. Even when you have eaten no food, plaque continues to form on the teeth. If you don't brush your teeth for a day or two, you can probably feel the plaque on your teeth. Because plaque is colorless, it is invisible to the eye unless it is allowed to accumulate on the teeth for several days.

The most widespread dental disease in children is dental caries. Dental caries is the result of a bacterial infection. For caries to occur, there must be plaque, simple sugars (any fermentable carbohydrate) and a susceptible tooth interacting for a period of time.

When food containing simple sugars is eaten, the bacteria breaks down the food and produces acid in the mouth. This acid also gets on the teeth, thus allowing it to attack the enamel. These acids may act on the tooth for at least 20 minutes after food is eaten. The degree to which the enamel is affected depends on the hardness of the tooth enamel. The strength of the acids, and the length of time the acids are allowed to remain on the teeth. After repeated acid attacks, the enamel begins to dissolve. Once this happens, the bacteria gain access to the body of the tooth and a cavity results. A way to reduce the frequency of acid attacks is to limit the number of times per day sugar is consumed. The frequency of eating sugar-rich foods, the length of time the sugar stays in the mouth, and the physical form of the food (such as sticky sweets) are all important factors in producing dental caries.

The decay process is as follows:

1. Sugar is used by bacterial plaque: acid is formed as a by-product. This is the beginning of the decay process.
2. ENAMEL, the hard outer protective covering of the tooth, is broken down by the acid.
3. The decay spreads into the DENTIN, a slightly softer layer that forms the bulk of the tooth.
4. If the decay penetrates to the PULP, the soft center tissue containing blood vessels and nerve tissue, an abscess may form at the root of the tooth.
5. If not treated by endodontic (root canal) therapy, the tooth may be destroyed.

While dental decay can be reversed at some point or repaired at most points, an early diagnosis is best to stop the decay process before irreparable damage is done.

3-A. THE PLAQUE MONSTER

Objective:The student will describe the influence plaque has on teeth.

Grade Level: K-5 **Materials/preparation**
Skit script

It is suggested that an older grade level class present this skit to a lower grade level.

Procedures:

1. Prepare for the skit as follows:

Characters are: Narrator, four Plaque Monsters, Cowboy Joe, Tonsils and four guards.

If you need fewer characters, combine some of the guards and plaque monsters parts. If you need more, use more monsters or guards to take part in the action without speaking.

The simplest set would use desk or chairs for the house and the Tooth Statue. You could also use boxes painted or covered with butcher paper, or you could use a butcher paper backdrop. You've just got to have one crack or hole where the Monster can hide.

The monsters are dirty and grubby, with most of their teeth blacked out. You could dress them in cutoffs and torn T-shirts, or gunny sacks and Halloween wigs. Their weapons could be things like hammers and picks and drills. (But be careful!)

Cowboy Joe is dressed like a cowboy, and Tonsils like an Indian. They ride stick horses (or they can even just pretend to ride them) and carry big toothbrushes in their gun holsters. Cowboy Joe carries a rope lasso.

The guards could be dressed in white shorts and pants. Instead of rifles, they carry big toothbrushes over their shoulders.

The narrator could be dressed in neat school or Sunday clothes. Or you could change the part a bit and have him sound like a reporter (like Kermit the Frog on Sesame Street) and dress in a long coat and carry a microphone. You are now ready to preform the skit.

THE COWBOY JOE AND THE PLAQUE MONSTER SKIT

Narrator: In a country not too far from here, there are two towns right next to each other. They are both small towns, but otherwise very different. The first town is called Toothsburg. Houses there are clean, white, neat, and in good repair. The people smile a lot because they're happy, and because they are very proud of their town. They enjoy smiling so much that they even have a statue of a smiling mouth in their town.

The other town is called Cavityville. It's houses are run down and full of big holes. The streets have chuckholes all along them, and it is a very dirty and ugly place. Cavityville is inhabited by an evil race of creatures called the Plaque Monsters, who never smile because their teeth are in such terrible shape that it even hurts to talk. The plaque monsters envy the people in Toothsburg, and often plot to see how they can take over the town and move in. They want to fill Toothsburg with cavities and make it just as ugly as Cavityville, but so far they have never been able to succeed. But today the plaque monsters are planning a new approach! (Plaque Monsters enter, talking together.)

Plaque Monster #1: How are we going to get into the town?

Plaque Monster #2: Getting in isn't the problem-staying there is what's hard. You can get in almost anytime when the guards go to dinner, but they always come back on patrol after they eat, and then they get us with those brushes!

Plaque Monster #3: Yeah, look they're going on their lunch break right now. Hey! I've got it! We sneak in there right now while they're not looking, and we will hide between the teeth in the statue! Not even the brushes can reach us there!

Plaque Monster #4: Great idea! Don't forget your weapons!

Narrator: The plaque monsters might have been successful in their evil plot, but at this very moment Cowboy Joe and his faithful friend Tonsils are riding into town. (Enter Cowboy Joe and Tonsils.)

Guard #1: Help! Help! The plaque monsters are attacking our teeth! Please help us, Cowboy Joe!

Cowboy Joe: Plaque Monsters? Where?

Guard #2: Over here! (They all run to the statue and attempt to brush the monsters out. They get all but one and chase them away, but the last one is hiding between the teeth.)

Guard #3: My brush won't reach him! What can we do?

Cowboy Joe: Never fear. I've got my trusty dental-floss lasso right here. Someone help me, and we'll have that plaque monster out of there in no time. (They help guide the lasso in between the teeth to catch the last monster.)

Cowboy Joe: We've got you now, you miserable monster! You won't get to bring your ugly cavities into Toothburg this time! Take him away, Tonsils. (Tonsils leads plaque monster away.)

Guard #4: Thanks Cowboy Joe, you've saved our town. I'd sure like to learn how to use that lasso of yours!

Cowboy Joe: I'd be glad to teach you anytime! (Exit.)

TEACHER'S NOTE: This would be a good time to have a lesson on dental floss and its use. Teach your students the proper way to floss. If your students do this activity with younger grades, have them teach the students how it should be done. (Students in grades K-2 should be told to have their parents help them floss so they don't injure their gums.)

Extensions:

1. Have students make up stories about a happy tooth that had no plaque and a sad tooth that had plaque.

2. Play a Board of Dental Geniuses. The object of the game is to gain a position on the Board of Dental Geniuses and maintain it as long as possible. Start the game by choosing four students for the board of dental geniuses. The rest of the class tries to stump the board by asking questions on dental health. The student who asks a question that can't be answered exchanges places with one board member.

3-B. A FORMULA FOR DECAY

Objective: The student will describe the influence plaque has on the teeth.

Grade Level: 2-4

Materials/Preparation:

Toothpicks
Glass microscope slide
Colored chalk
Worksheet

Procedures:

1. Introduce the activity by asking the students what they know about tooth decay. Accept all answers, but do not indicate whether any of them are correct or incorrect.

2. Use a toothpick to scrape some of the whitish material from the base of a tooth. Place the scrapings on a glass microscope slide. Show the students. Indicate that this is PLAQUE and is the stuff that causes decay. Indicate that plaque is made up of bacteria. Bacteria are present in everyone's mouth. Saliva and food help the bacteria grow and attach to the teeth.

Place the following formula on the chalkboard:

sugar + bacterial plaque = acid
acid + tooth = decay

3. Draw a picture of a tooth with colored chalk and label it (**enamel**, **dentin**, **pulp** and **cementum**). Indicate that enamel is the hardest part of the tooth, but is made of material that can be dissolved by acids. The dentin is much softer and can be dissolved easier than the enamel. The pulp is very soft and contains nerves and blood vessels. Cementum is the outer covering of the root.

Simulate decay by putting a smear of plaque on the side of your drawing. Add sugar to feed the bacteria. Show the acid dissolving the enamel. Discuss reasons there is no pain until the pulp is reached.

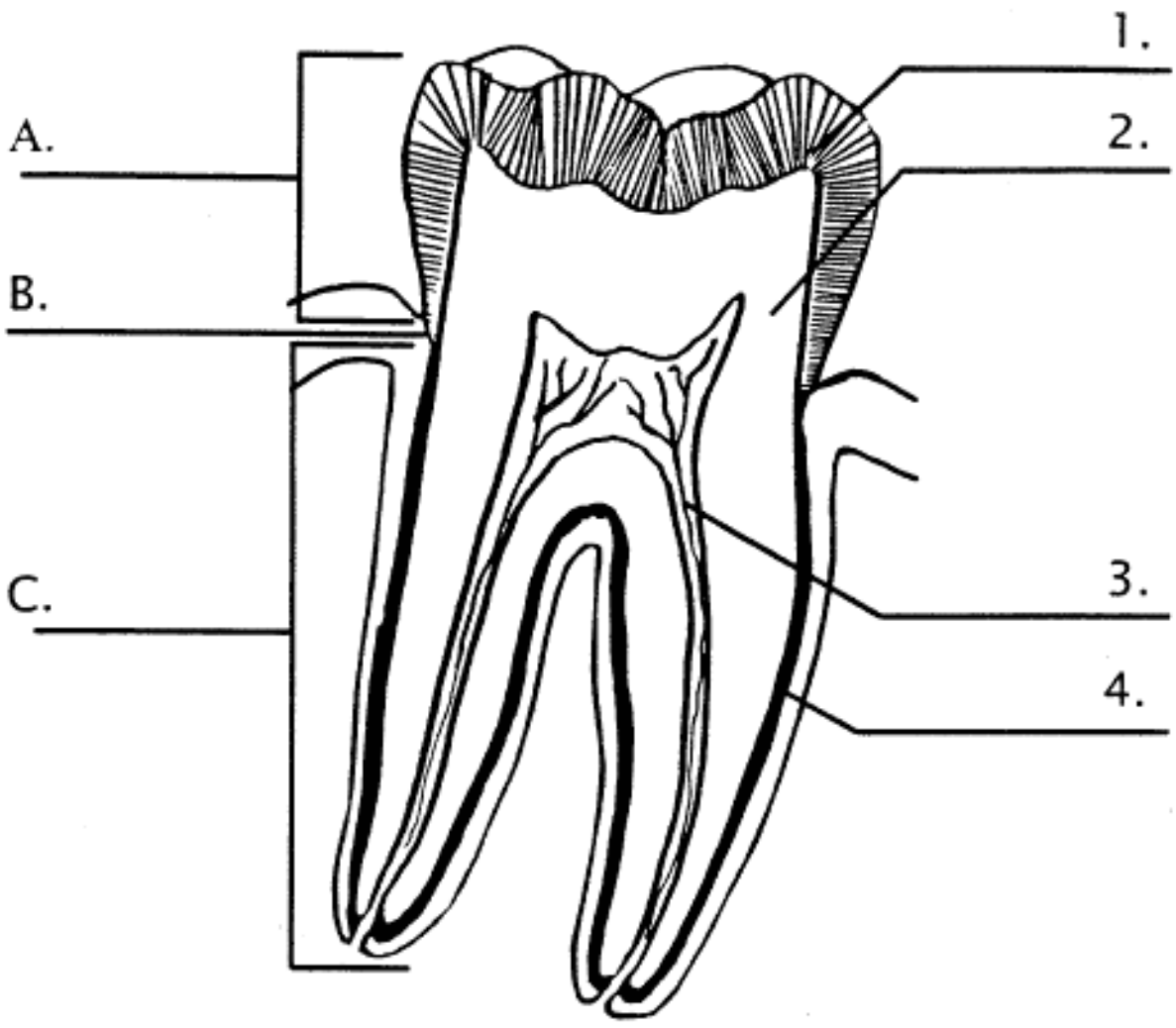
4. Distribute the Parts of the Tooth worksheet and have students label the parts. **Answers:** A. Crown, B. Gums, C. Root, 1. Enamel, 2. Dentin, 3. Pulp, 4. Cementum.

Extensions:

1. Obtain animal teeth and place them in various solutions, such as vinegar, soda, or dilute hydrochloric acid. Observe the teeth over a period of weeks.
2. Discuss other diseases that are caused by bacteria such as some sore throats, diphtheria, tetanus and whooping cough.

WORKSHEET: Parts Of The Tooth

NAME: _____



FILL IN THE BLANKS USING THESE WORDS:

cementum crown root
enamel dentin gums pulp

3-C. ALL THE PLAQUE YOU EVER WANTED TO SEE

Objective: The student will describe the influence plaque has on the teeth.

Grade Level: 2-6

Materials/Preparation:

Soda straws
Food color
Water
Glass
Sink
Toothbrushes and floss
Mirrors

Add one part red food color to five parts water in a glass.

TEACHERS NOTE: This activity can be very messy, especially for younger children.

Procedures:

1. Plaque is hard to see. The purpose of this activity is to color plaque so that it will be easier to see. Distribute soda straws to students. Have students sip a small amount of water colored with food color. Have them swish the liquid around their mouth and then carefully spit it out in the sink or in a cup.

CAUTION: Don't get the food color on clothes because it will stain them.

2. Rinse the mouth with clean water.

3. Look at the teeth with a small mirror. The red color on the teeth is dyed plaque. The tongue and lips may be colored for a short time.

4. Brush and floss the teeth to remove the plaque.

5. Indicate that plaque continues to increase in amount unless it is removed thoroughly once a day. This is why we brush and floss.

3-D. ACID, EGGS AND BONES

Objective:The student will describe the influence plaque has on teeth.

Grade Level: K-6 **Materials/Preparation:**

Eggs
Chicken leg bone
2 jars or glasses
Vinegar

Procedures:

1. Introduce the lesson by providing information on the role bacteria plaque and acid play in tooth decay. Adapt background information for your grade level student.

2. Explain that certain acids dissolve minerals such as calcium, one of the minerals in teeth, bones and egg shells. One of these acids is found in vinegar.

3. Place an egg in a jar or glass of vinegar. Observe the egg closely. Do you see any bubbles? Feel the egg after 6, 24 and 48 hours. What happens to the calcium?

4. Put a cooked chicken leg bone in a container of vinegar. Feel the bone every day for two weeks. What happens?

5. Continue the activity by discussing the following information:

Relationship of Bacteria and Plaque

Plaque is a sticky, invisible film that is made up of colonies of bacteria which adhere to the teeth. These bacteria have the ability to change sugar into decay producing acid. Plaque is dentally dangerous because it can hold the acid next to the teeth, which dissolves the tooth structure and leads to decay. Plaque is also a major factor in causing gum disease.

Daily Plaque Removal

Dental decay can be reduced by removing the plaque that accumulates on the teeth at least once every 24 hours. This breaks up the bacteria colonies and prevents the acid from being held on the tooth. Tooth decay begins under the dental plaque, so the bacteria responsible for tooth decay is not harmful if there is no plaque or the teeth. For this reason, it is important that the children participate in a daily plaque removal program by thorough brushing and flossing, ideally supervised by their parents. As their teacher, you can aid the parents by stressing the importance of cleaning teeth on a daily basis. You can also encourage students to brush their teeth after lunch when at school. If it is not possible for them to brush, than they should be encouraged to rinse their mouth after eating.

Formula for Decay

Dental decay is a complex process involving the interaction of three factors: 1. teeth; 2. bacteria (plaque); 3. sugar or other fermentable carbohydrates. The disease does not occur if any one of these factors is missing. Theoretically, people could prevent decay by doing one of the following:

1. Eliminate sugar from the diet
2. Eliminate plaque from the teeth
3. Eliminate teeth or fortify them with fluoride

Many people think that eliminating sugar is the easiest and most effective way of preventing decay. Realistically, however, it is impossible to eliminate all sugar from our diet, simply because it is found in nearly every food that we eat. Instead of teaching our students to quit eating sugar, it is more reasonable to teach them to regulate how often they eat it. It is the frequency of sugar consumption not the quantity eaten that contributes to dental problems. Each time sugar is eaten, acid is produced, remaining in the mouth for approximately thirty minutes. Therefore, the total exposure of the teeth to acid attack is determined by the number of times that sugar is eaten each day. Teach your students to eat their sugary snacks with their meals and to eat non-cariogenic (sugar free) snacks between meals. This will allow them to enjoy a sweet without subjecting their teeth to extra acid attacks.

Plaque is composed of millions of bacteria that attach themselves to the teeth, and even beneath the gums. These bacteria have the ability to change sugar into acid, which, when held next to the tooth by the plaque, dissolves the enamel and causes decay. Daily plaque removal (brushing and flossing) will prevent the acid from being applied to the teeth, thus preventing the development of decay. The plaque can form again within 24 hours, so daily brushing and flossing are important. Ideally, children should brush their teeth after eating lunch when they are in school. If this is not possible, children should be encouraged to rinse their mouth after eating.

The most effective way of avoiding cavities would be to remove all the teeth. However, since false teeth pose many more problems than natural teeth, this is clearly not a reasonable consideration. It is much wiser to use fluoride to fortify the teeth so they are resistant to decay. Preventing decay beats taking a chance on getting cavities or of losing all the teeth. Therefore, it is important that the proper use of fluoride be understood by the students, and that they receive an adequate amount of it each day.

Maximum prevention is attained when all three elements of the formula are addressed:

1. Re-Education in the frequency of sugar intake
2. Daily brushing and flossing to remove plaque
3. Informed daily use of fluorides

Extensions:

1. Soak an egg in fluoride mouthrinse for 24 hours. Set up a controlled experiment in which you compare the effect of vinegar (an acid) on the fluoride soaked egg, and on an egg that has not been exposed to fluoride. (Fluoride mouthrinse can be purchased from a drug store or supermarket.)

2. Make a hole in an unbruised apple. Use a knife to pierce the apple about an inch deep. Remove a piece of apple about the diameter of the knife. Place the apple in a bag for a few days. Then cut through a cross section near the hole. Observe how the decay has spread. Indicate that this is how decay spreads in a tooth, only not as rapidly.

TOPIC FOUR
Preventing Tooth Decay

Program Goal 4.0: To develop an understanding of tooth problems and how to prevent or alleviate these problems.

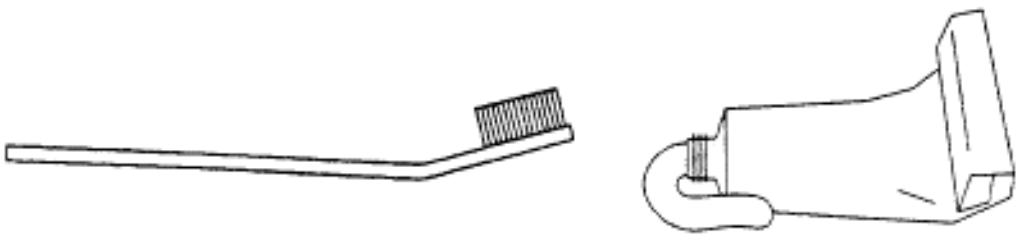
Background Information

The single most effective element in the reduction of dental decay is fluoride. Fluoride is considered an essential nutrient for the growth and development of teeth and bones. It may be found naturally in most water supplies and in some foods.

There are two ways in which fluoride is utilized, systemically and topically. Systemic fluoride is taken into the body by swallowing. It affects the developing teeth and bones. Fluoride is incorporated into the developing enamel to make it more resistant to decay. Systemic fluoride is obtained either from drinking water that has a fluoride content of about 1 ppm (parts per million), or from drops or tablets taken at home. Fluoride drops are given to infants and tablets are given to older children. To get the full benefit of systemic fluoride, it should be given daily from birth through at least age 14. It is recommended that all children have either, but not both, of these exposures to systemic fluoride.

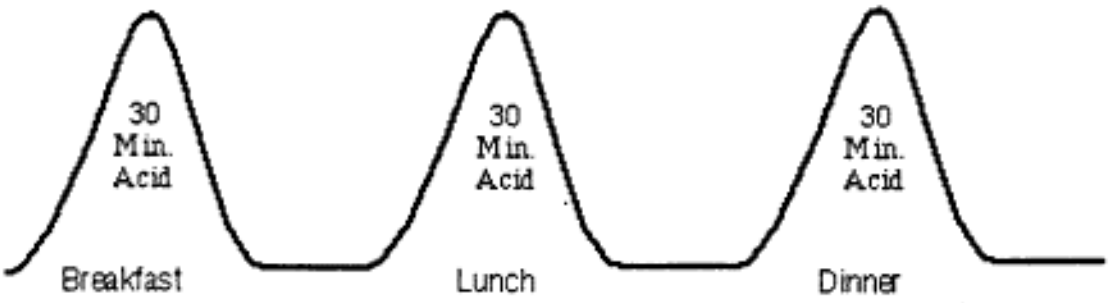
Topical fluorides are applied to the teeth already present in the mouth resulting in a temporary protection against tooth decay. There are three common methods for applying topical fluorides: a fluoride dentifrice (toothpaste) should be used at least once a day; fluoride mouthrinses can be used on a weekly basis at school or a daily basis at home; and, during regular dental checkups topical fluoride may be applied to the teeth by the dentist or dental hygienist. It is recommended that children take advantage of as many topical exposures as are appropriate, since the combination is probably more beneficial than any single method alone. To find out how your school can participate in a free fluoride mouthrinse program, contact the Dental Health Program, Kentucky Cabinet for Human Resources at (502) 564-3246.

Fluorides are most effective against decay on the smooth surfaces of the teeth. The pits and fissures, or biting surfaces of the back teeth, are still subject to decay even when fluoride is used. For this reason sealants are used to protect these tooth surfaces from decay.



In the sealant procedure, the dentist or dental hygienist applies plastic resins in liquid form to the pits and fissures. The resins harden and seal out the decay-causing bacteria. As long as the sealant is in place, the tooth is safe from decay. If the sealant comes off, the dentist can replace it. The sealants are clear or lightly tinted and are not readily noticeable. Sealants work best on newly erupted permanent teeth. Therefore, a child should be considered for sealants at age 6-7 when the first molars appear, and again at age 11-12 when the rest of the permanent teeth appear. Sealants are not appropriate for teeth with fillings or decay, or for the teeth of adults.

Whenever sugar is eaten, acid is produced by the bacteria in the mouth. This acid remains in the mouth, causing a significant reduction in pH for approximately 30 minutes. This acid in the mouth for long periods of time can cause tooth decay. The more frequently sugar is eaten, the longer the acid exposure and the greater the chance of cavities forming. For example, when we eat three times a day, acid production is limited mostly to three 30 minute periods or 1-1/2 hours.



Each between-meal sweet snack will add another 30 minute acid producing time.

If sweets are eaten many times a day, it is possible that acid production will be practically continuous and the teeth may decay more rapidly.

Elimination of between-meal snacks of sweets will decrease plaque formation by reducing the amount of acid formed on the surfaces of the teeth.

Brushing alone does not remove the plaque between the teeth. This plaque is best removed with floss. Water sprays reduce food debris, but do not remove plaque. The best method for controlling plaque is to thoroughly brush and floss every tooth every day. However, the best method for reducing dental caries is still the daily use of systemic fluoride through age 14, and the lifelong daily use of topical fluorides.

Regular dental checkups are important if dental disease is to be prevented and controlled. Dental caries may begin as soon as a child has teeth. Children should have their first dental examination before all of the primary teeth have erupted (usually before age 2). There is no set rule for how often a child should visit the dentist. In general, it is suggested that dental visits be made every six months. In part, the frequency will depend on the individuals eating habits, how clean the mouth is kept, and whether decay is present. After checking the child's teeth, the dentist will be able to suggest an appropriate schedule. During regular dental visits, the dentist can:

1. Develop rapport and trust between the child, the parent, and the office staff.

2. Professionally clean the teeth to remove calculus and stains.

3. Apply fluoride and prescribe a fluoride supplement for daily home use to make teeth less susceptible to dental caries.

4. Apply sealants to protect the decay-prone chewing surfaces on the back teeth.

5. Detect early dental caries and other diseases through the use of visual and x-ray examinations.

6. Treat developing cavities early, while the damage is still minimal.

7. Provide instruction on plaque control (brushing and flossing).

8. Provide diet counseling.

4-A. ELEPHANTS AND FINGERS

Objective:The student will conclude that nutrition and eating habits may influence tooth decay.

Grade level: K-2 **Materials/Preparation**
None

Procedures:

1. Discuss ways students care for their teeth. List their suggestions on the chalkboard.

2. Read the story, "Pee Wee the Elephant". Have students listen for ways to care for teeth. Compare the methods found in the story with those listed on the chalkboard.

3. Teach the "Have Fun with Betty and Bobby" finger play.

Pee Wee The Elephant

Once upon a time there were three elephants living in the zoo. The great big daddy elephant's name was Blimpo. The mother elephant's name was Nimbo and the baby elephant's name was Pee Wee.

All of them had large ears that flopped when they walked and when they ate their food their large trunks reached out, picked up the food, and placed it in their mouths.

They loved to eat and every morning the zoo keeper brought them three big baskets of vegetables-corn, tomatoes, celery, carrots, beans and apples, oranges and lots more too. They would chew the vegetables and fruit with their great big elephant teeth. Crunch, crunch, crunch. Pee Wee just loved to hear the sound of those crunchy fruits and vegetables in her ear.

"Here's a little girl with some peanuts. Mmmmmmm, thank you," she mumbled. "These are really so good. And here's a little boy with some popcorn. I love popcorn, so I think I'll stuff my mouth."

One day a new little girl came to the zoo with a snack in her hand. Pee Wee wondered what was in it so when she opened it she reached inside with her trunk and pulled out several little round things. They were different colors, red things, yellow things, blue things, orange things, and every other color of things you can think of. She put one in her mouth and discovered a new taste. It was sweet and it was good, so she kept putting them into her mouth. She kept filling her mouth with things and before very long her mouth was stuffed full. Her cheeks were all puffed out and she could hardly chew.

Now her mother, Nimbo was watching Pee Wee and she was wondering what she had in her mouth. She called, " Pee Wee, what are you chewing?" Pee Wee tried to answer but her mouth was so full that all she could do was mumble something that her mother couldn't understand. However, mom had seen the little girl with the sack and she guessed that candy was in it and that was what Pee Wee had in her mouth.

"Pee Wee, you mustn't eat so much candy. The candy might stick to your teeth and the bacteria in your mouth will change the sugar into acid which will start a hole in your teeth. And one of these days you'll wake up with a cavity in your tooth and it will hurt terribly. Your daddy, Blimpo, ate too much candy, drank too much pop, and was chewing gum all the time until he got a terrible toothache and a swollen jaw. Do you want a cavity in your tooth?" Now, Pee Wee had never had a cavity and she didn't know how badly a toothache can hurt, so she just shrugged her shoulders and paid no attention to her mother's warning.

Every day the same little girl came to the zoo to visit Pee Wee and she brought her a sugary snack that she stuffed into her mouth. She would always save some of it so she could have an afternoon snack. Some of the candy kept sticking to her teeth and the bacteria in her mouth made acid which started making little cavities in her teeth. But Pee Wee didn't know this was happening because she couldn't hear or feel the little bacteria at work making tooth decay. They were too little to be heard and too little to be seen.

One morning Pee Wee woke up and her tooth really hurt. Her jaw was swollen. She was frightened because she'd never had a toothache. She put her little trunk in the air and cried for her mother. "Wooooo, wooooo." Her mother heard her cry and came running into her bedroom. "Pee Wee, what is the matter?" she asked. Pee Wee's tooth hurt so badly and her jaw was so swollen that she could hardly tell her mother what was wrong, so she opened her mouth and showed her the terrible cavity in her tooth.

"Oh, you poor little elephant. You've eaten too many sweets everyday and you didn't take care of your teeth. Now you have a cavity and we will have to call Doctor Mellow." Doctor Mellow was the dentist who had fixed Blimpo's tooth when he had a cavity.

Doctor Mellow went to the zoo to see Pee Wee. "I understand you have a problem," he said. "Open your mouth and let me take a look," Pee Wee opened her mouth and Doctor Mellow looked inside with his little dental mirror. "Yes, Pee Wee, you've got a problem but I think I can fix it."

So Doctor Mellow took out his tools and worked on Pee Wee's tooth. He used his drill to drill out the decay and to prepare the tooth for the silver filling. When Dr. Mellow finished,

Pee Wee's tooth felt much better and Pee Wee asked what she could do to avoid anymore cavities. She was told to brush and floss daily, visit the dentist regularly, avoid eating sugar, use fluoridated toothpaste, take fluoride tablets, and participate in the school fluoride mouth rinse program.

Pee Wee promised Doctor Mellow that she would take better care of her teeth. Dr. Mellow promised Pee Wee that if she would spend a few minutes every day doing the things she was just taught, she could keep her teeth forever. Pee Wee was told she should snack on things like vegetables instead of candy and sweets. This doesn't mean that she can't eat sweets, but she should eat them with her meals. Before Pee Wee left the office, Dr. Mellow gave her a fluoride treatment to help protect her teeth against decay. Dr. Mellow told her that fluoride was one of the best friends her teeth could have. Now Pee Wee takes excellent care of her teeth. She started brushing and flossing and using fluoride every day and she visits the dentist regularly. She eats good snacks and saves the sweets to eat with her meals. Pee Wee is taking such good care of her teeth that they will last forever. Would you like to keep your teeth? Then follow Pee Wee's example.

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HAVE FUN WITH BETTY AND BOBBY

A Dental Health Finger Play

Narrative (Actions)

Bobby came out of his tree house to see what he could see.
(Lift index finger of right hand)
He looked down the street, then up the street.
(Finger turns to right, then left)
He looked down on the ground then up in the tree.
(Finger points down, then up)
And he saw papa and mama bird flossing their baby's beak.
(Move both hands back and forth as though flossing)

Bobby's friend Betty came out of her house to see what she could see.
(Lift index finger of left hand)
She looked down the street, then up the street.
(Finger turns right, then left)
She looked up the tree, then down on the ground.
(Finger points up, then down)
And she saw papa and mama dog brushing their baby's teeth.
(Move hand as though brushing)

Another friend, Randy, came out his front door to see what he could see.
(Lift little finger of left hand)
He looked down the street, then up the street.
(Finger turns right, then left)
He looked down on the ground, then up in the tree.
(Finger points down, then up)
And he saw papa and mama squirrel putting fluoride drops on their baby's tongue.
(Touch finger to the tongue as though using drops)
Betty noticed Bobby and said, "Look look, do you see?"
(Left index finger turns towards right index finger)
They both looked up, and they both looked down.
(Have both fingers look up and both look down)
And they were as excited as they could be.
(Index fingers bobbing rapidly up and down)
They waved to each other, the birds, the dogs, and the squirrels.
(Hands wave to each other, the birds, the dogs and the squirrels)
Then they ran to their homes to brush and floss their teeth.
(Fingers imitate brushing and flossing, then disappear into their homes)
And they didn't forget their fluoride.
(Point both index fingers at the children)
(Have them take a bow by bending the wrist and have them clap for themselves, by using the index fingers and thumbs)

Extensions:

1. Distribute 3 x 5 file cards with "I CARE" printed at the top. Have students draw pictures that illustrate ways to care for teeth. Suggest that they tape these on the bathroom mirror at home.

4-B. SUGAR DISPLAY

Objective: The student will conclude that nutrition and eating habits may influence tooth decay.

Grade Level: 1-6

Materials/Preparation

10 test tubes with caps
Test tube holder
Sugar
Measuring spoon
Sugar Contents Chart
Labels

The test tube holder can be made from wood or styrofoam. It should measure 11" x4" X 1" with holes the diameter of the test tubes drilled 1" apart.

Procedures:

1. Have the children choose a favorite snack. Then find it on one of the sugar content charts found on the following page. Have the students put the corresponding amount of sugar in test tubes and label them. A striking impression is made when the children see how much sugar is actually in certain foods they enjoy eating. Involving the children is also very effective in keeping them interested in the discussion.

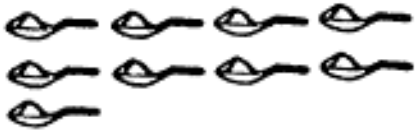
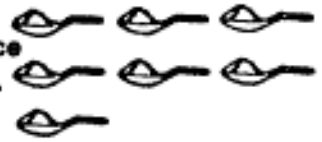
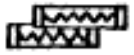
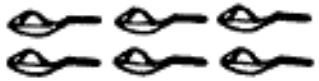
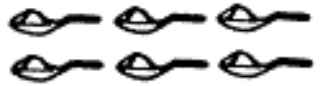
Alternatively, you could have the test tubes pre-filled with sugar. This method allows the teacher to exercise more control over the finished product and you can stress the foods you feel strongly about.

2. Lead to the conclusion that sugar is in almost everything we eat. Discuss the need to limit sugar intake between meals. The discussion should include the concept that the more frequently sugar is eaten, the more dangerous it is.

Extensions:

1. Devise a poster and sugar display to depict the information from this lesson.

Sugar Contents Chart

FOOD ITEM	SUGAR CONTENT IN TEASPOONS	FOOD ITEM	SUGAR CONTENT IN TEASPOONS
 8 ounces Soda Pop		 ½ Cup Sherbet	
 4 ounce piece Chocolate Cake with Icing		 1 average piece Apple Pie	
 1 Tablespoon Strawberry Jam		 1 Tablespoon Honey	
 Ice Cream Cone		 1 medium bowl Cold Cereal with ½ Tsp. Sugar	
 1½ ounce Chocolate Bar		 2 sticks Chewing Gum	
 1 Glazed Donut		 1 Oatmeal Cookie	

4-C. DENTAL HEALTH ADVENTURE WITH MOTHER GOOSE

Objective: The student will conclude that nutrition and eating habits may influence tooth decay.

Grade Level: 1-4

Materials/Preparation:
It would be best if you knew the story and did not have to read it.

Procedures:

1. Follow the outline as presented below.

A Dental Health Adventure with Mother Goose

Boys and girls. I have a real surprise for you today. It is special because it involves, "Mother Goose," and a magical, imaginary trip to that wonderful world where she lives. To be invited on such a trip is a special honor, because she is rather particular about who she lets visit. She only allows children to visit who will promise to obey all her rules, and her most important rule is that you should listen to her nursery rhymes to see if you can learn the hidden message about your teeth. We will talk about those messages when the trip is finished.

Mother Goose has sent her own private plane to pick us up and take us on this imaginary trip, which is about to begin. "Listen."

"Flight 306 to Mother Gooseland is ready to take off. Would Miss/Mrs./Mr. class please board the plane and fasten their seat belts?"

After the plane takes off, we are entertained by one of the characters in Mother Gooseland. It is a cute little mouse who keeps running up a clock and saying,

"Hickory, Dickory, Dock
The mouse ran up the clock.
It said to the children. 'Your teeth must be clean,
Or Mother Gooseland can't be seen.'
Hickory, Dickory, Dock."

"O.K boys and girls, you heard the warning, so let's use our imagination and take care of our teeth before we land in the magical, pretend world of Mother Goose."

(Note to teachers: Have the children go through the actions of each verse of the following rhyme.)

"This is the way we brush our teeth,
Brush our teeth, brush our teeth,

This is the way we brush our teeth,
When we get up in the morning

This is the way we rinse with fluoride,
Rinse with fluoride, rinse with fluoride,

This is the way we rinse with fluoride,
Every week at school.

This is the way we floss our teeth,
Floss our teeth, floss our teeth,
This is the way we floss our teeth,
Before we go to bed.

This is the way we call the dentist,
Call the dentist, call the dentist,
This is the way we call the dentist,
When we need a checkup."

We have all brushed and flossed our teeth, taken our fluoride, visited the dentist and we should remember to eat our sugary snacks only at meal time. Now we are ready to travel through Mother Gooseland with Mother Goose herself.

In fact there she is standing on the platform waiting for us. Look! She sees us and is waving. I am surely getting excited about our adventure, aren't you?

The pilot, who happens to be the same cow who "jumped over the moon," has made a perfect landing and taxied right up to where Mother Goose is standing. Now that the door has opened, everyone should rush over to Mother Goose and shout, "Hi, Mother Goose."

(Note to teachers: Encourage the children to wave and say, "Hi, Mother Goose.")

"Children listen to what I have to say," she said.
"To market, to market to buy some toothpaste,
Home again, home again tiggalty haste.
To market, to market to buy a toothbrush,
Home again, home again, now let's brush."

But Mother Goose, we've already brushed and flossed, rinsed with fluoride, and visited the dentist before we landed."

"Well in that case, let's go visit Mother Gooseland", Mother Goose said. "Our first stop will be in front of the world famous shoe house where:

"There was an Old Woman who lived in a shoe,
She had so many children she didn't know what to do
To some she gave floss, and to others a brush,
And sent them to bed without any fuss."

Did you notice that everyone cleaned their teeth before they climbed into bed? And can you see the smile on their faces as they sleep? The reason, of course, is because their teeth are clean. We must hurry if you are going to see all of Mother Gooseland. How many would like to visit Jack and Jill? All right, then let's go!

On our way to Jack's and Jill's, Mother Goose stops us and points out a:

"Little crooked man, who walked a crooked mile,
He had a crooked toothbrush, to brush his crooked smile.
He bought a crooked cat, which caught a crooked mouse.
And they all brushed with fluoride in a crooked little house."

Watching that crooked man, his cat, and mouse brush their crooked smiles is very interesting and after spending a few minutes watching we go on our way.

We reach Jack's and Jill's place without any more interruptions and just in time to watch as:

"Jack and Jill went up the hill
To fetch a pail of water.
Jack fell down and broke his crown,
And Jill came tumbling after.
Up they got,
And to the dentist did trot,
As fast as they could go.
He fixed Jack's tooth with a little gold crown,
That's the dentist's job, you know."

Do you wonder why Jill took Jack to the dentist? The reason is simple. Many years ago Jack broke his tooth and the dentist repaired it by putting a cap or crown on it. Jill took Jack to the dentist, because in falling down the hill he broke his crown again.

After leaving Jack's and Jill's hill, we see five little pigs and are fascinated watching as:

"This little pig went to the dentist,
This little pig stayed home.
This little pig had three cavities,
While this little pig had one.
And this little pig yelled, 'fluoride is great', all the way home."

They enjoy watching the last little pig who is so happy and excited that he runs, jumps, kicks his heels together, and does two somersaults and three flip flops. Mother Goose explains that he is so happy "because the fluoride has made his teeth so strong and healthy, they will last forever."

"Mother Goose," someone asks, "I hear someone crying. Do you?"

"Let's check it out," she says. "Oh, my goodness! It isn't just one person, but several little girls are crying. This is serious. What should I do? Can anyone tell me what happened here?"

A brave little boy, who is trying to make the girls feel better, timidly raises his hand to tell Mother Goose why the girls are crying. He says,

"Georgie Porgie, pudding and pie,
Kissed the girls and made them cry;
And when the boys came out to play,
Georgie Porgie ran away.

Mother Goose wonders why a little kiss would make them cry, and all the girls say, Because Georgie Porgie had bad breath.

The trip through Mother Gooseland is almost finished, but we are having so much fun that we don't want to leave. However, Mother Goose just received word that the cow wanted to jump over the moon again. "Oh dear," she says, The last time she tried that, she got stuck and it took a week to get her down. I must talk her out of it or you won't have a pilot to take you home. Why don't you come with me, and on the way we will stop at Mary's school house:

"Mary had a little lamb,
With teeth as white as snow.
And everywhere that Mary went,
The lamb was sure to go.
It followed her to school one day,
Which was against the rule,
It made the children laugh and play,
To see a lamb brush his teeth at school."

The trip to Mother Gooseland is over now, and she was certainly a good guide. Let's tell her thanks.

Wait a minute! Before we go she wants to tell us one more thing.

Mother Goose's Message:

"Take care of your teeth by brushing, flossing, and using fluoride every day. Eat sweet things only with your meals, and visit your dentist regularly. Do these things, and your teeth can last forever."

(Note to teachers: Tell your students that Mother Goose needs a special helper. Invite a student to come up, then whisper Mother Goose's message in his/her ear and have him/her repeat it to the other students.)

2. Discuss the following:

   A. Why does Mother Goose want you to have clean teeth before you can see Mother Gooseland?

   B. If you were friends with the children who lived in the shoe, what would you tell them to do with their toothbrushes after they brushed their teeth?

   C. What message does the nursery rhyme about the little crooked man give to us?

   D. Why did Jill take Jack to the dentist?

   E. Why did one little pig have three cavities?

   F. Why did one little pig yell, "fluoride is great?"

   G. How can Georgie Porgie cure his bad breath?

   H. Why was it so funny to see a lamb brush his teeth at school?

   I. Who is responsible for caring for your teeth?

   J. Why should I follow the examples of the nursery rhyme characters and take care of my teeth?

4-D. SADDLE SEAL AND FLOPPY FLUORIDE

Objective: The student will identify fluoride and sealants as the most effective agents in preventing tooth decay.

Grade Level: 4-6

Materials/Preparation:
List of vocabulary words
List of made-up words

Procedures:

1. Present the story to the class. Keep your delivery free-flowing and enthusiastic to make the story as entertaining as possible.

2. Select the extensions appropriate for your class.

Ladies and gentlemen, boys and girls, and any dogs and cats that may be hiding on your lap. Welcome to our primpy, prime, pantheistic production (emphasize pro). We promise to tickle the pinnacle particles precariously protruding from the inner sanctums of that part of your body commonly known as your mouth. For those who don't know what I just said, let me translate. It means, "We plan to keep you interested in this story while at the same time teaching you how to keep your teeth healthy."

For those of you who haven't already guessed, I am a pretty smart fella who loves to tanglelate (impress) people with big words. You will notice that every now and then I make up words (like tanglelate), but only when I can't think of anything better to say.

Let me introduce the characters in this story.

The first is a tooth named DIMPLE DAN. Dimple Dan, is a molar. You know, one of those big back teeth that crushes your food when you chew. He is funny looking because on his top he has peaks (like mountains) and valleys. Bacteria love to hide in the valleys on your molars.

The second silly succulent character is disaffectionately known by all bacteria as SADDLE SEAL. But those cuebacious dentists, who fearlessly lead the fight for freedom from cavities, call this character a SEALANT. However, since I am telling this story I will call him Saddle but he will answer to Sealant.

DR. JUMPIN' JIMBO JACKSON is our third character. He is a dentist presently preoccupied with practicing his profession by putting Saddle Seal on the permanent molar teeth of all the boys and girls who sit down in his dental chair. With sealants, he drives all the poor unlucky bacteria out of their valley homes and into the cold cruel world.

The funnelgistic fourth character is FLOPPY FLUORIDE. It makes me fireball mad when dentists travel all over Kentucky, hopping from here to there, prancing and parading, shouting and singing, "His Majesty the King, Floppy Fluoride the First, is teaming up with Saddle Seal to eloquiously eliminate dental disease."

Finality can finally be felt as I introduce the last but also the finest, zaniest, most promising of all the characters, namely ME. My name is TOUCHE. This story is about me and my unlucky, unfortunate, unusual undoing by Dr. Jumpin' Jimbo Jackson and his mighty powerful mixture of fluorides and sealants.

Now this story is obviously different from any story you have ever heard about the teeth because I am not going to say one word about brushing and flossing, eating sugar less frequently or visiting the dentist regularly. Any knowledgeable knuckleball thinker knows that those things are important and anyone who wants to keep their teeth healthy will already be doing them every day. So in this story I am going to tell you about sealants and fluoride, the best cavity fighters I ever saw.

You see, I am a nice, sweet, cute little bacterium. I live in the valleys of Dimple Dan, the molar, with my many friends who are also bacteria. They are almost as nice, sweet and cute as me. We work hard at what we do best, making acid to cause tooth decay.

We are generous with our acid and we give Dimple Dan more than he really needs. In fact we give him so much acid that it forms swimming pools and fishing ponds in his valleys. This acid slowly but carefully makes cavities in Dimple Dan. We are the best bacteria in the west. We have more ways to destroy teeth than you have teeth. We want to tell you about the three tomangenous reasons for liking tooth decay. They are:

1) **Losing your teeth is good for you.** Once a tooth has been destroyed, a person can save time because they have fewer teeth to brush and floss. (But we won't talk about the problems that missing teeth can cause, OK?)

2) **Sooner or later every one gets tooth decay.** We just help speed up tooth decay so that you won't have to wait so long for this marvelously magnificent experience. (This is really a terribly terrific LIE, because today you **do not have to suffer from tooth decay.** But please don't tell anyone or poor little Touche will be out on the street looking for a new mouth to live in.)

3) **Toothaches are nice.** Now if people didn't suffer from toothaches once in a while, they wouldn't appreciate their good healthy teeth. Right? (Wrong! But that will be our secret and you mustn't tell anyone.)

I felt insulted. I felt humiliated and I feel terrible that Dimple Dan didn't take my advice and I felt betrayed as he sat in Dr. Jumpin' Jimbo Jackson's dental chair. I wanted to run when Dr. Jackson started cleaning Dimple Dan and his friends. In the process he destroyed my beautiful home, my fishing hole, and my swimming pool. I didn't have a chance to make even one small cavity in Dimple Dan.

As I sat helplessly watching Dr. Jackson destroy everything I had done, I started to brag, as only the best braggarts can do. I told all the other bacteria he couldn't stop us from coming back and rebuilding our homes and swimming pools in Dimple Dan's valleys. I was determined to make a cavity in that tooth. But then that dentist put Saddle Seal on Dimple Dan and all his molar friends. I was confident that those sealants wouldn't stop me or my friends because we had too many tricks. We thought we were too smart for Dr. Jumpin' Jimbo Jackson, but boy were we wrong.

We went back to work immediately. I called out the reinforcements and we must have had millions of bacteria digging and scratching at that Saddle Seal Sealant, but to my dismal dismay I made a terrible, treacherous, tantilic discovery. Sealants are made from plastic and our powerful acid couldn't hurt them. Dr. Jumpin' Jimbo Jackson put that Sealant on all those molars so tight, that even our smallest bacteria couldn't sneak down that side and into the bottom of the valleys. If only we could attack from the inside, we could cause the Sealant to fall out, but Jumpin' Jimbo Jackson is a smart dentist and he filled in Dimple Dan's valley with sealants. Sealants stopped us from causing any tooth decay.

Before Dr. Jumpin' Jimbo Jackson put the dental chair down, he had another surprise for us, and we didn't appreciate it one bit. He told Dimple Dan about His Majesty the King, Floppy Fluoride the First, and then he put some fluoride on all the teeth in that mouth. He explained to Dimple Dan, that if he wanted to prevent tooth decay, then he must take one fluoride tablet every day until he was 14, brush with a fluoride toothpaste, participate in the fluoride mouthrinse program at school, and have the dentist give him a fluoride treatment regularly. We begged and we pleaded with Dimple Dan not to listen to Dr. Jumpin' Jimbo Jackson, but it didn't do any good, and I am standing on a street corner looking for a new home, with someone who doesn't know about Saddle Seal Sealant or His Majesty the King, Floppy Fluoride the First.

I must say good-by to you because Dimple Dan doesn't have any cavities and he probably won't ever get any. But don't feel sorry for me, because it won't take long to find another good home in an unsuspecting creations tooth. When I do, you can bet your big beautiful button hooks that he or she will not know about SADDLE SEAL SEALANT or HIS MAJESTY THE KING, FLOPPY FLUORIDE THE FIRST.

Extensions:

1. Divide the children into two teams. Each team will be given two words, "SEALANTS" and "FLUORIDE". Their assignment will be to use the letters in each of the words to spell as many other words as possible. For example, from the word "SEALANTS" they can spell the words sent, ten, neat. etc. and from "FLUORIDE", flour, red, rule, etc. The letters from the two words cannot be combined, rather each word must be used separately.

Give the children a time limit, and the team with the most words will win the contest. However, let the opposing team challenge any unfamiliar words. The challenged team may

then defend their word by simply looking it up in the dictionary. If it is in the dictionary the challenging team does not lose any points, because you don't want to discourage them from learning dictionary skills or new words. However, for each word not found in the dictionary, the team who made it up must subtract three words. This penalty should discourage the teams from making up words, but at the same time encouraging then to look in the dictionary if they are not certain whether or not a word really exists.

We found 46 words in "SEALANTS" and 48 words in "FLUORIDES." Plurals are acceptable. Count double for every word longer than four letters.

2. The following words are found in the story and are also found in many 4th and 5th grade spellers. Have the children look these words up in the dictionary for the definition and correct pronunciation.

already	freedom	notice
beautiful	good-by	powerful
bottom	guess	pretty
carefully	healthy	really
causes	hide	reason
common	important	scratching
crush	interested	slipped
decided	introduce	smart
destroy	king	surprised
explained	known	teeth
fearless	marvelous	terrible
felt	mountain	tight
fight	mouth	treatment
filled	work	

3. Have the children use at least 10 of the vocabulary words and write a short paper answering the following question. "Will Touche find a new mouth to live in and what will happen to him?"

4-E. LESS TOOTH DECAY

Objective: The student will conclude that nutrition and eating habits may influence tooth decay.

Grade Level: 2-4

Materials/Preparation:

Puppet script (Page 51)
3 sack puppets

Procedures:

1. Begin the activity with the Less Tooth Decay puppet play. Discuss the play. What made Mr. Decay happy? What defeated Mr. Decay?

2. Place the following two formulas on the chalkboard. Discuss the process of decay:
   Sugar + bacterial plaque = acid
   Acid + tooth = decay

3. Discuss how brushing with a fluoride toothpaste helps prevent decay.

4. Indicate that most tooth decay is initiated in the first 30 minutes after a sweet is eaten. This is the time period when the bacteria in the mouth produce acid.

   When we eat only three times a day, acid is only produced during those three 30 minute periods a day. Emphasize that each snack adds another 30 minute acid cycle.

5. Have students list the times they ate something in the past 24 hours. Then have them make a graph of acid exposure. Do a few examples on the chalkboard first.

Less Tooth Decay

Puppet Play (4 characters)

BILLY: HI! I'M BILLY HAPPY TOOTH

STORY TELLER: WHY ARE YOU HAPPY, BILLY?

BILLY: I JUST CAME FROM THE DENTIST. I HAVE NO CAVITIES.

TELLER: THAT IS GOOD NEWS. WHY DO YOU THINK YOU HAD SUCH A GOOD CHECK UP?

BILLY: BECAUSE I TRY TO FOLLOW THE "BIG FIVE" RULES.

TELLER: WHAT ARE THOSE RULES? CAN YOU TELL US?

BILLY: OH, YES. FIRST, HAVE A REGULAR CHECKUP BY YOUR DENTIST AT LEAST EVERY SIX MONTHS. THE DENTIST CAN FIND AND CORRECT SMALL PROBLEMS BEFORE THEY GET TO BE BIG. THEN ... (enter Susie Bad Tooth. Mr. Decay sneaks in.)

SUSIE: (EATING CANDY) BOO-HOO-HOO! I FEEL SAD. I HAVE A TOOTHACHE.

BILLY: SUSIE, YOU MUST GO TO THE DENTIST RIGHT AWAY. HE CAN MAKE YOUR TOOTHACHE GO AWAY.

SUSIE: OUCH! IT HURTS. I GUESS I HAD BETTER GO. MAYBE I'LL GET THERE TOMORROW. (goes right on eating candy bar.)

MR. DECAY: AH-HAH! MY WORK IS NOT DONE. SUSIE BAD TOOTH MAKES THINGS EASY FOR ME. I GET A LOT DONE WHEN SHE EATS CANDY EVERY 30 MINUTES.

BILLY: LISTEN. SUSIE, WOULD YOU LIKE TO STOP TOOTHACHES?

SUSIE: OH YES BUT HOW CAN I DO THAT?

MR. DECAY: OH, NO! IF SUSIE LISTENS TO BILLY, I'M LOST!

BILLY: WELL, FIRST GO TO THE DENTIST AND GET YOUR CAVITIES FILLED. NEXT, BRUSH YOUR TEETH OFTEN WITH A GOOD FLUORIDE TOOTHPASTE. FLOSS YOUR TEETH EVERY DAY AND WATCH YOUR BETWEEN MEAL SUGARY SNACKS, AND MOST IMPORTANT. MAKE SURE YOU DRINK WATER WITH ENOUGH FLUORIDE IN IT OR TAKE YOUR FLUORIDE TABLET EVERY DAY.

MR. DECAY: RATS I'VE LOST ANOTHER CUSTOMER!

THE END

4-F. RINSE DAY FOOTBALL

Objective: The student will identify fluoride and sealants as the most effective agents in preventing tooth decay.

Grade Level: 2-4

Materials/Preparation:
This activity is intended to be used in conjunction with a school fluoride rinse program.

Procedures:

1. One of the most cost-effective self-applied topical fluoride techniques is a fluoride mouthrinse in school. Once a week students in Kentucky rinse for one minute with a 0.2% sodium fluoride solution. Research has proven weekly rinsing in school reduces cavities by an average of 35%.

2. To help motivate quiet, efficient classroom rinsing, each week set aside ten to fifteen minutes, which includes both time for rinsing and playing Rinse Day Football. Explain to the class that the faster the rinse is completed, the more time will be available to play the game. Choose students to participate who were quiet and courteous during the rinse. Penalties for unsportsman like conduct may be called for misbehavior during the rinse. Penalties might include lost yardage or lost playing time.

3. Present a lecture on fluoride facts, or other subject matter. Draw a field on poster board, which can be put away weekly, or quickly draw a grid on the blackboard each week.

Touchdown
No Cavities

Touchdown
No Cavities

Rules for Rinse Day Football

A. The receiving team begins at their own 20 yard line, and advances 10 yards for each correct answer. A toss of the coin determines the first team to receive questions.

B. The receiving team continues to advance until a question is missed, then the other team takes over and advances from that point.

C. When the ball changes sides, the new receiving team can, "run back the punt," by answering the question missed by the other team. They will advance 20 yards for a correct answer, or simply take possession in place for an incorrect answer.

D. Team members take turns answering questions, with no help from other team members. Illegal prompting results in a loss of the ball. However, when "returning the punt," the team may huddle and decide on their answer.

E. A touchdown is scored by reaching the goal line, and counts 6 points. The teacher then asks an "extra point" question, which scores 1 point. If penalties push a team back to their goal line, a touchback worth two points is scored.

Suggested Questions

You may wish to adapt these questions to the abilities of your class, or write your own questions.

1. Spell fluoride. (f l u o r i d e)

2. What are the two general ways of providing fluoride? (Systemic and topical)

3. Is a systemic fluoride swallowed or applied directly on the teeth? (Swallowed)

4. Name two different methods of providing systemic fluoride. (Water fluoridation and fluoride drops or tablets)

5. What is the most effective and inexpensive way to provide systemic fluoride? (Water fluoridation)

6. What does fluoridated water mean? (Fluoride is added to drinking water at the source to bring the fluoride level up to one part per million)

7. What part of the tooth is fluoride protecting? (enamel)

8. What ages should receive systemic fluoride? (Birth to age 14)

9. Why is systemic fluoride recommended from birth to age 14? (This is the time tooth enamel is forming)

10. What is the result of taking systemic fluoride from birth to age 14? (Tooth enamel will be more resistant to decay)

11. What is topical fluoride? (Fluoride that is placed directly on teeth)

12. Do topical fluorides become a permanent part of a tooth? Explain. (No, they are temporarily incorporated into the outer tooth surface and then slowly leached away)

Extensions:

1. Once the fluoride questions are no longer a challenge, write new dental health questions on brushing, flossing, seeing a dentist, or eating habits for good dental health.

2. Review other subjects using Rinse Day Football.

4-G. TOOTH DECAY ROLE PLAY

Objective: The student will identify fluoride and sealants as the most effective agents in preventing tooth decay.

Grade Level: 3-5

Materials/Preparation:

Whacker (nylon stocking, rag, balloon, etc.). Represents the acid that was produced from sugar and bacteria.

Jacket represents the protection that fluoride gives to the tooth.

Number of Students involved:
Three or four students needed to represent the following:

a. Non-fluoridated tooth with cavity
b. Fluoridated tooth
c. Plaque-(attacks teeth)
d. Dentist (the teacher may want to play this part to maintain proper perspective).

Procedures:

1. Initiate the activity by reviewing or discussing the following:

   A. Benefits of seeing a dentist regularly
      1. Keep your teeth for a lifetime.
      2. Avoid pain.
      3. Cavities are cheaper and easier to restore when small.

   B. The mechanics of the decay process.

   C. Effectiveness of fluoride.

2. Role play the function of fluoride.

   A. Select a student to represent an unfluoridated tooth. This tooth is attacked by the plaque using the "Whacker". After being attacked several times have the tooth yell "OUCH" and hold its mouth to indicate that it has a toothache. (To add more fun and excitement to this role play, have the tooth jump up and down and moan and groan as if it really is in pain.)

Send the tooth to the dentist and have him look in the mouth. Make the diagnosis that there is a cavity and it must be repaired. Have the dentist go through the motions of repairing the tooth.

a. A shot to deaden the pain
b. Drilling out the decay
c. Filling the cavity

Explain that this cavity was repaired while it was still small and the tooth was saved. If this tooth waited to see the dentist until the cavity was bigger, it would have been much more expensive and difficult to save.

B. Select a student to represent a fluoridated tooth. Put the jacket on the tooth and have it kneel on the floor. Explain that this represents a tooth before it erupts. The fluoride that it took was used to strengthen teeth. Have the tooth stand up to represent an erupted tooth. Have the plaque attack this tooth with the Whacker. After being attacked a few times, instruct the tooth to stick out its tongue at the plaque and go "BLAH". Explain that this indicates that the fluoride was protecting this tooth. Have this tooth go to the dentist for a checkup. Of course, everything will be fine and the dentist will congratulate it and encourage it to continue taking fluoride. Explain that this tooth can last forever without ever having a cavity; also, that it is better to prevent dental decay that to repair the tooth.

C. Have both students come to the front of the class and ask the class which one they would prefer having in their mouth, the fluoridated tooth or the unfluoridated tooth.

Extensions:

1. Use a construction "hard hat" or football helmet to represent sealants and extend the discussion to use of sealants.

2. Have students do the Dental Acrostics Worksheet.

WORKSHEET: Dental Acrostic

NAME_____

An acrostic is made by writing a word(s) and then using the individual letters of the word(s) as the beginning of a sentence. Using the words DENTAL HEALTH, make an acrostic. One letter is done for you. (The words at the bottom should be used in your sentences.)

D_____
E_____
N_____
T_____
A_____
L_____
H_____
Eating sugar may cause tooth decay.
A_____
L_____
T_____
H_____

bicuspid	cavity	fluoride	plaque
filing	gingivitis	toothbrushing	cementum
periodontal disease		tooth decay	flossing
calculus			

4-H. HOW FLUORIDES AFFECT TEETH

Objective: The student will identify fluoride and sealants as the most effective agents in preventing tooth decay.

Grade Level: 3-6 **Materials/Preparation**
Worksheet (Page 58)

Procedures:

1. Introduce the lesson by asking students what they know about fluoride. Accept all answers.

2. Indicate that fluoride is a mineral which, along with other minerals like calcium, phosphorus, and iron, is essential for good health. Fluorides occur naturally in some foods and in water supplies.

3. Distribute the Fluorides & Decay worksheet. The students will need to read the story to solve the puzzle.

Answers: (Fluoride Puzzle) Fluorapatite or Fluoridation, Fluoride, Calcium or Helpful, Phosphorus or Toothpaste, Surface, Topical, Acid, Teeth or Areas. (Scramble) Visit the Dentist for Topical Fluoride.

WORKSHEET: Fluorides and Decay

Name_____

Teeth are made up of minerals. The mineral, apatite, is found in tooth enamel. Apatite crystals contain calcium, phosphorus and fluoride. When fluoride is present, it combines with apatite to form as acid resistant mineral called fluorapatite. If fluoride is present as teeth develop, the teeth are more resistant to decay.

The usual method of obtaining fluoride is in drinking water. The water in some areas has natural fluoride in it. Other communities add fluoride. Where water fluoridation is not possible, some people take fluoride tablets. Tablets should be taken daily until a person is about 14 years old.

Fluorides can also be applied to the surface of the tooth. This is called topical fluoride. This can be done by a dentist during regular visits or at home by brushing teeth with a fluoride toothpaste. Sometimes it is helpful to obtain fluoride from more than one source.

Fluoride Puzzles

The words needed to fill the blanks are found in the above reading.

F _ _ _ _ _ _ _ _ _ _

_ L _ _ _ _ _ _

_ _ _ _ _ U _

_ _ O _ _ _ _ _ _ _

_ _ R _ _ _ _

_ _ _ I _ _ _

_ _ _ D

_ _ E _ _

Unscramble These Words

SITIV_____ ILACOPT_____

TENDTIS_____ LOFUIDRE_____

ROF_____ HET_____

4-I. THE MAKING OF A HEALTHY TOOTH

Objective: The student will conclude that nutrition and eating habits may influence tooth decay.

Grade Level: 4-6 **Materials/Preparation:**
Worksheet

Procedures:

1. Distribute the Healthy Teeth Worksheet (Page 60). Ask students to see if they can name the mystery items. **Answers:** 1. Fluoride, 2. Calcium, 3. Phosphorus, 4. Vitamin C, 5. Protein.

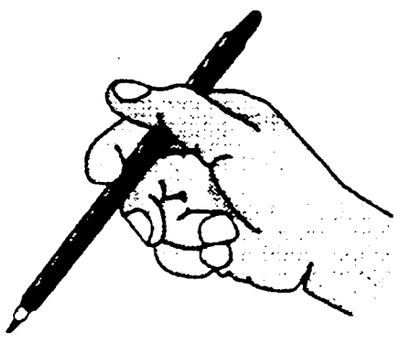
2. Discuss fluoride, calcium, phosphorus, vitamin C, and protein as related to healthy teeth & gums.

Extensions:

1. Write Haiku poems using the Healthy Teeth vocabulary as subjects. Haiku poems have five syllables in the first line, seven in the second, and five in the third.

Example:

Fluoride in water
Helps to make my teeth harder
No more cavities



WORKSHEET: Healthy Teeth

NAME_____

1. The first mystery item is found in some foods, in some water, is sometimes added to water, may be in toothpaste.

   What is it? _/_/_/_/_/_/_/_/
   (eight letters)

2. The second mystery item is found in milk and milk products, fish, and enriched or whole grain bread.

   What is it? _/_/_/_/_/_/_/
   (seven letters)

3. The third mystery item is found in foods such as meat, milk, cheese, eggs, cereals and vegetables.

   What is it? _/_/_/_/_/_/_/_/_/_/
   (ten letters)

4. The fourth mystery item is found in citrus fruits, tomatoes and helps keep the gums healthy.

   What is it? _/_/_/_/_/_/_/_/
   (eight letters)

5. The fifth mystery item is found in meat, eggs, beans and peas, fish and poultry. It helps protect against infection and damage to the gums.

   What is it? _/_/_/_/_/_/_/
   (seven letters)

TOPIC FIVE

PREVENTING PERIODONTAL DISEASE

Program Goal 3.0: To develop an understanding of tooth problems and how to prevent or alleviate these problems.

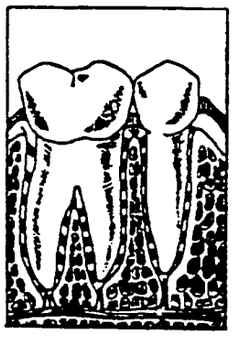
Background Information

The greatest cause of tooth loss is periodontal disease. It has been estimated that periodontal disease is responsible for the loss of more teeth than all other causes combined and from three to seven times more than dental caries. The loss of teeth is no longer considered a natural component of the aging phenomenon, but is recognized as representing the result of a pathological process. Periodontal disease may start during the childhood years, therefore, it is important to teach children about this potential problem. Studies have shown that 38% of all school-age children suffer from the early stages of periodontal disease, predisposing them to irreversible gum disease and loss of teeth in their adult years.

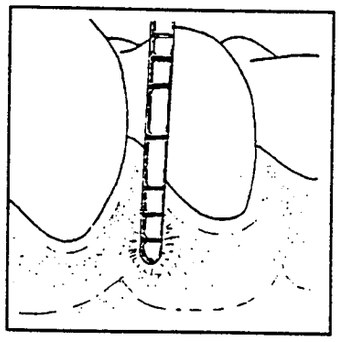
What is periodontal disease? Periodontal disease is an infection of the gums and other tissues that support the teeth. It is a chronic inflammation of the gum tissue which progresses over a period of years to destroy the connective fibers and bone around the roots of the teeth, resulting in the loss of teeth. In its early stage, it is referred to as gingivitis. Gingivitis is an inflammation of the gums due to plaque buildup. They become red and swollen, stand away from the teeth and bleed easily when touched. Gingivitis can often be reversed by proper daily brushing and flossing. The more destructive form of periodontal disease, and the major cause of tooth loss in adults, is periodontitis. Periodontitis causes irreversible changes in the supporting tissues of the teeth and even destruction of the bone that holds the teeth in place. Treating periodontitis may require expensive treatment and the lost bony support can never be regained.

The primary cause of periodontal disease is plaque. Bacteria in plaque produce chemicals that may irritate the gums, and over time, seriously damage the structures that hold the teeth in place. Figures 1 through 4 illustrate the role plaque plays in the progression of periodontal disease.

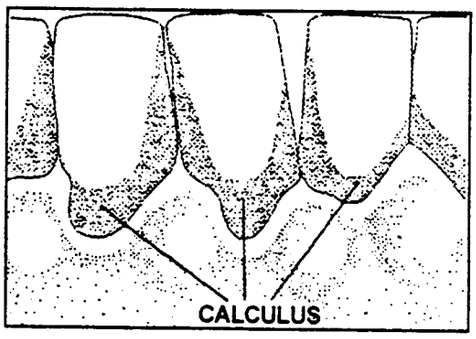
1. Healthy gingiva (gum tissue) and bone anchor the teeth firmly in place.



2. The by-products of plaque irritate the gums. This can cause the gums to become red, tender and swollen and to bleed easily.



3. Unremoved plaque hardens into a deposit called calculus (tartar). Calculus can be a contributing factor in periodontal disease, for it makes the removal of new plaque more difficult. Calculus deposits can be removed only by a dentist or dental hygienist. The tissue that attaches the gums to the teeth is destroyed by the irritants in plaque. The gums pull away from the teeth, forming small pockets that become filled with more plaque.



4. Plaque moves down along the roots of the teeth, making the pockets deeper. Eventually, the irritants may destroy the bone supporting the teeth. Unless treated, the affected teeth become loose and fall out or must be removed by a dentist.

Although periodontal disease is caused by plaque, other factors also influence the disease. Physical and chemical irritants in the mouth can damage the gums and supporting tissue. Food caught between the teeth, toothpicks, improperly used toothbrushes, malocclusions, defective fillings, or poorly fitting dentures can irritate gums and supporting bone. Smoking and smokeless tobacco may also irritate tissues or damage the gums.

Brushing and flossing are two weapons used against periodontal disease. Brushing helps remove plaque from the outer, inner and chewing surfaces of the teeth. Daily flossing removes plaque from the areas along the gum line and between the teeth. Early stages of periodontal disease (gingivitis) can often be reversed by daily flossing & brushing properly.

A well balanced diet will contribute to keeping oral tissues healthy. Regular professional cleaning of teeth helps keep tartar buildup down. If any of the following indicators of periodontal disease are noticed, an appointment should be made with the dentist immediately.

1. Gums that bleed when you brush your teeth.

2. Gums that have pulled away from teeth.

3. Gums that are tender, red or swollen.

4. Pus that emerges when the gums are pressed.

5. Permanent teeth that are loose.

6. Any change in the way your teeth fit together when you bite.

7. Recurring bad breath.

The method of treatment of periodontal disease depends upon how far the disease has progressed. Even in the early stages, professional help is essential.

5-A. BRUSHING

Objective: The student will investigate the influence of brushing and flossing in preventing periodontal disease.

Grade Level: K-3

Materials/Preparation:

Prior to this activity, assign students to bring a toothbrush from home. Label each with name on masking tape. Make egg carton storage racks by punching holes in each section and tape top to the wall.

Procedures:

1. Begin the activity by discussing toothbrushing. Have a few students demonstrate or explain how a person should brush his/her teeth. Ask why they brush their teeth and how often. Ask why they use fluoride toothpaste. Accept all techniques and answers. Indicate that today's lesson will help them understand why we brush our teeth

2. Review the concept of PLAQUE and what it does to the teeth. Indicate that we brush our teeth to remove disease-causing bacteria.

3. Distribute the "How to Brush Your Teeth" handout. Discuss the techniques illustrated.

4. Get toothbrushes and practice brushing. Toothpaste is not really required for classroom plaque removal.

5. Check to see if any students have bleeding gums. This could be caused by an improper toothbrush, poor technique, or may indicate periodontal disease. Examine all toothbrushes.

Dentists usually recommend a brush with a straight handle, a flat brushing surface, and soft round-ended bristles. Soft bristles are less likely to injure the gums.

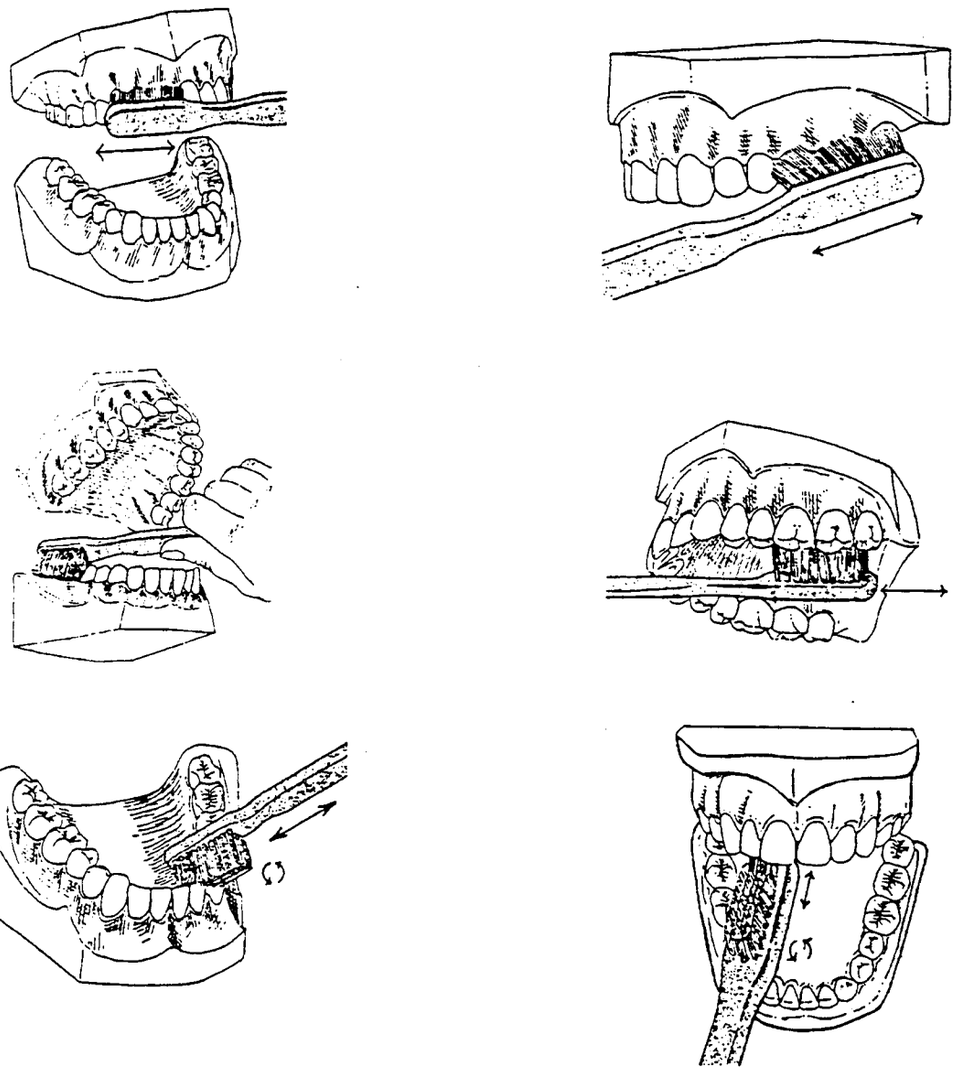
Extensions:

1. Set up a parents' night where students put on dental skits from this book and demonstrate their ability to control plaque.

HANDOUT: How to Brush Your Teeth

NAME_____

Place the head of your brush along side your teeth, bristle tips angled against the gum line.
Brush the insides of the front teeth with the "toe" part of the brush wiggling gently.
Move the brush back and forth with several gentle strokes. Make sure every tooth is brushed.
Brush the outer, inner, and chewing surfaces of your upper and lower teeth.



Proper ways to brush your teeth.

5-B. BRUSHING AND FLOSSING

Objective: The student will investigate the influence of brushing and flossing in preventing periodontal disease.

Grade Level: 3-6

Materials/Preparation:

2 pillow cases
1 broom
1 jump rope
Black construction paper
Masking tape
Dental floss
2 worksheets (Pages 67 and 68)

Procedures:

1. Begin the activity by reviewing the following:

   bacterial plaque + gums = gingivitis
   gingivitis + neglect = periodontal disease

   Indicate that brushing and flossing are the recommended ways to remove plaque.

2. Choose two students to role play teeth. Place pillow cases over them and have them stand close together with their backs to the class. Use masking tape to place pieces of black paper on the teeth. First use the broom to gently remove the plaque (black paper) from the teeth. Repeat the process with the jump rope. Emphasize the need for dental floss to get between the teeth.

3. Distribute the Brushing Technique worksheet.

4. Distribute dental floss and the Flossing Technique worksheet (Page 68). Follow the sequence outlined.

Extensions:

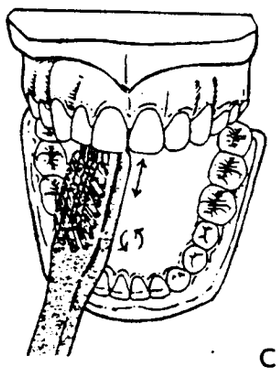
1. Make your own tooth powder by combining 3 parts bicarbonate of soda and 1 part salt. Flavor with oil of peppermint.

2. Discuss claims made by toothpaste and sugarless gum advertisements from magazines.

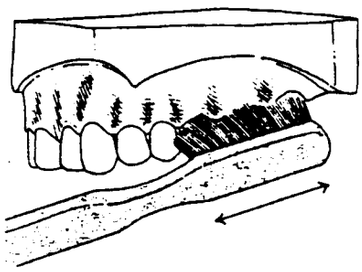
WORKSHEET: Brushing Technique

NAME_____

A



B



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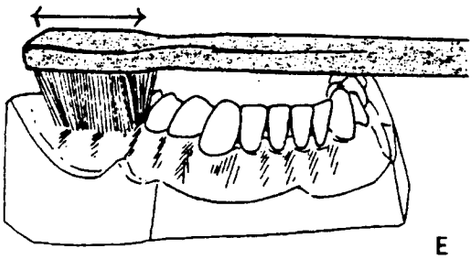

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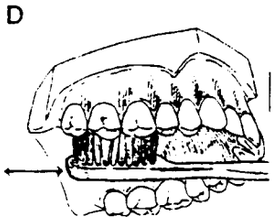
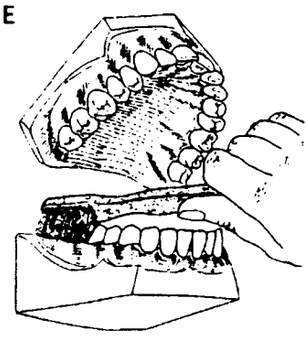


E

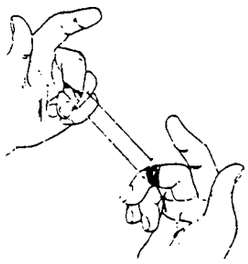


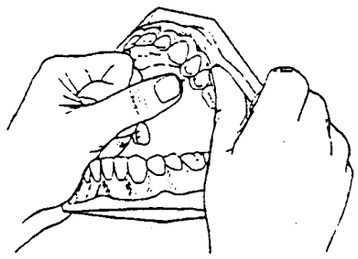
- Brush inside of front teeth by holding the brush straight up and down.
- Brush the outside of upper and lower teeth and gums.
- Brush chewing surfaces of all teeth.
- Brush inner part of lower and upper teeth. Brush gums.
- Tilt toothbrush against the teeth where teeth and gums meet.

WORKSHEET: Flossing Technique

NAME_____

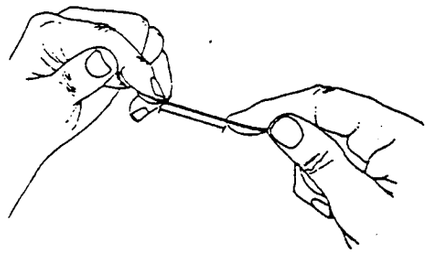
a. Break off about 18 inches of floss.
b. Wind most of the floss around one of the middle fingers.
c. Wind the remainder around the other middle finger to "take up" the floss as it becomes soiled.
d. Use thumbs and forefingers with one inch or less of floss between them to guide floss between the teeth.





Upper teeth and Lower teeth

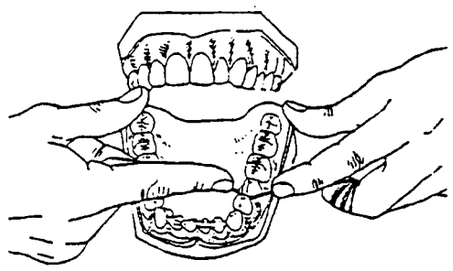
e. Hold floss tightly (no slack) and use a gentle sawing motion to insert floss between two teeth. Never "snap" the floss into the gums.



f. When floss reaches the gum line, wrap it into the space between the gum and tooth making a "c" with the floss.

g. Pull the floss tight against the tooth and move the floss away from the gum by scraping the floss up the side of the tooth. Do the same procedure on the adjacent tooth before you remove the floss.

h. Repeat steps (d) through (g) for all other teeth.



5-C. BRUSHING AND FLOSSING CONTRACT

Objective: The student will investigate the influence of brushing and flossing in preventing periodontal disease.

Grade Level: 3-6 **Materials/Preparation:**

Sample contract worksheet (Page 70)
Cards

Procedures:

1. Contracts have been used effectively in various behavior modification programs, so why not try it with a dental health unit? This concept, if used must be taken seriously and both parties must fulfill their part of the agreement. Otherwise, the probability of the concept working will be very poor.

Some points to remember in contract writing include:

A. Work with only one of two possible behaviors (brushing and flossing, taking fluoride, or visiting the dentist.)

B. Describe the desired behavior very clearly (i.e., brush three times a day with fluoridated toothpaste and floss every tooth once each day.)

C. Clearly identify the rewards as well as the penalties. (Remember that regards can motivate better than punishments can.)

D. Write the contract so that everyone can understand it.

E. Be consistent, and make sure that the rewards are given only if the student earns them.

On the next page is a sample contract worksheet that you can use with your students. Use your creativity and come up with some original rewards. You might even let the students suggest their own.

You are encouraged to individualize the contracts as much as possible. Perhaps paragraph Number 1 could be the same for the entire class, while the individual could make his or her own suggestions for paragraphs 3 and 4 (with your approval). Use your creativity in developing ideas for this activity. See the sample contract that follows for ideas.

Dental Health Contract

This contract, made on this _____ day of 19_____, between _____, hereafter called the student, and _____ hereafter called the teacher, witness that the student and teacher do jointly agree to honor, uphold and carry out to the best of their ability, the promises made in this contract to wit.

I. I the student agree to take excellent care of my teeth for the period of _____ weeks beginning on _____. I will faithfully follow the principles of good oral hygiene, as has been taught by the teacher, which include:

A.

B.

II. I, the student, agree to involve my parents by having them return a signed note to the teacher stating that I have fulfilled the agreements of this contract.

III. I, the student, agree to do the following if all the conditions of this contract are not met:

A.

B.

IV. I, the TEACHER, agree that, if the student faithfully follows the principle's of good oral hygiene, as outlined in paragraph one, I will:

A. Give lots of praise on the student.
B. Reward the student by:
   1.
   2.
   3.
   4.

We have both read the terms and conditions of the above contract and agree to them as written.

_____ Student

_____ Witness

_____ Student

_____ Witness

5-D. FLOSS IS BOSS

Objective: The student will investigate the influence of brushing and flossing in preventing periodontal disease.

Grade Level: 3-6 **Materials/Preparation:**
None

Procedure:

1. "Floss is the Boss", is a follow-along story written by J. Dennin Kamholtz, Ed.D, and Bill Wood, both of whom are instructors at the University of Maine. This story stresses the importance of good oral hygiene by using a combination of funny sounds and a variety of motions. It leads the students to the conclusion that flossing is the most effective method they can use to remove plaque and debris from their teeth. Your students will enjoy this story!

PREPARE FOR MOTIONS AND SOUNDS

Whenever the words **teeth, tongue, whistle, toothbrush, mouth wash** and **floss** are mentioned, certain sounds and motions follow. Select one student or a group of students to represent each of these six words. As the story is read, the appropriate sound and motion is made by the appointed student or group.

For example:

1. **TEETH**
   Sound-clickity, click, click, clickity, click, click.
   Motion- Move your fingers to the side of your face, as if it were a gigantic mouth and then smile while rapidly opening and closing the mouth, and clicking the teeth together.

2. **TONGUE**
   Sound- Slurp, slurp, slurp, slurp.
   Motion-Rapidly move your tongue in and out of your mouth (this will make the slurping sound).

3. **WHISTLE**
   Sound-A long exaggerated whistle

4. **TOOTHBRUSH**
   Sound-Ping
   Motion-Produce an imaginary toothbrush from your pocket and put some imaginary fluoride toothpaste on it and brush your teeth.

5. **MOUTH WASH**
   Sound-gargling sound
   Motion-Swish it around the mouth, gargle and spit it into the sink.

FLOSS IS THE BOSS

READ THE STORY, SLOWLY

This is the story about some **teeth** and a **tongue**. Now the **teeth** and the **tongue** work together to help chew your food. One day, the **teeth** and **tongue** were chewing on some _____ and some _____. (Have the students name a favorite food.) The **teeth** and **tongue** decided they would get as clean as a **whistle.** So, they took out a **toothbrush**. And they brushed their top **teeth** as well as their **tongue**. But when they were through, there were still some tiny bit of food left on the **teeth** and that's bad news!

So they got out the **mouth wash** and they swished it around in their mouth and they swished some more. But when they were through, there were still some tiny particles left on the **teeth**, and that's bad news!

So there was nothing left to do but to get out the dental **floss** and they flossed their **teeth.** And when they were through, their **teeth** and their **tongue** were both as clean as a **whistle**!

That's because-

Who's the boss? (repeat the appropriate flossing sound and motion)

Extensions:

1. Teach the students the following song, "Little Johnny Had a Toothbrush'" sung to the tune, "Rueben, Rueben".

"Little Johnny Had a Toothbrush"

Little Johnny had a toothbrush
And he hung it on the wall.
Morning, noon and night it hung here,
And he used it not at all.
Then one day while at the table,
He began to scream and cry,
Mother, mother, I have a toothache,
And I think that I shall die.

Mother took him to the dentist
But the dentist shook his head.
Too late, too late, too late, Johnny,
You will lose this one, he said.
It's too late for little Johnny,
But it's not too late for you.
If you use your toothbrush daily.
Now will you, and you and you?

5-E. FLOSS CONTRACT

Objective: The student will conclude that brushing and flossing are effective in preventing periodontal disease.

Grade Level: 4-6 Materials/Preparation:
worksheet

Procedures:

1. Use materials from background information to introduce the concept of periodontal disease. Discuss causes, symptoms and prevention. Lead the discussion to an emphasis on the need for flossing to remove plaque around gumlines and between teeth.

2. Distribute the Self-Contract worksheet. Instruct students on worksheet procedures. Discuss results a week later.

Extensions:

1. Consider a school survey for determining what percentage of students floss their teeth regularly, sometimes or never. Categorize by grade and sex.

2. Use the school newsletter to explain the reasons for flossing.

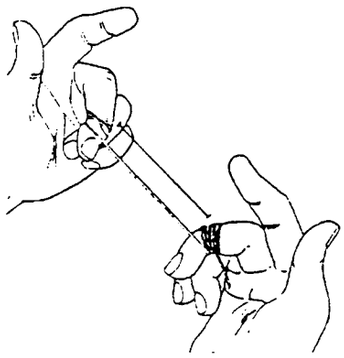
WORKSHEET: Self Contract

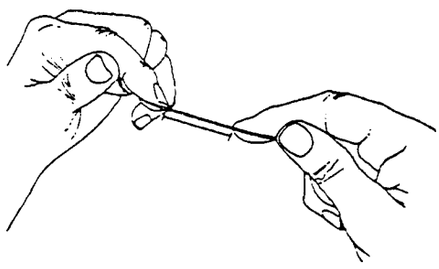
NAME_____

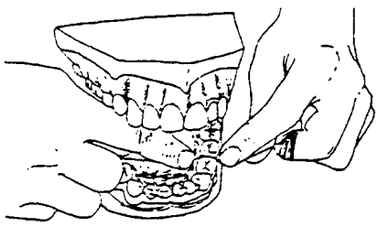
Flossing My Teeth

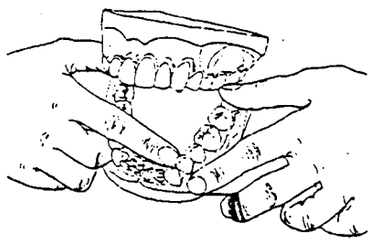
You have been learning to make a plan for good dental health. The plan says: (1) brush your teeth after each meal, (2) floss your teeth once each day, (3) eat foods from the milk group each day, (4) eat fruit that helps you have healthy gums, (5) eat fewer snacks with sugar, (6) if you chew gum, use sugarless, (7) go to the dentist every six months.

The pictures below show the correct way to floss. Help yourself form this health habit by doing the self-contract.









GOAL: I will floss my teeth each day.

PLAN: (1) I will plan a regular time when I will floss.
(2) I will keep a record for each day I floss my teeth.

EVALUATION: My gums seem to be more/less tender: bleed more/less: and my teeth are more/less clean since flossing this week.

RESULTS: I was/was not able to reach my goal.

In the future I will try to _____

5-F. PERIODONTAL DISEASE MATH

Objective: The student will conclude that brushing and flossing are effective in preventing periodontal disease, will save money and prevent tooth problems over the long run.

Grade Level: 4-6 **Materials/Preparation:** worksheet

Background Information

Students should be aware that their parents invest a large sum of money in their teeth.

Some of the dental investments that parents may make in their children's teeth include such things as: checkups, braces, fillings, crowns, sealants, fluoride tablets, toothbrushes, toothpaste, dental floss, etc. Over the years these things can add up to hundreds and perhaps even thousands of dollars. Something so simple as toothbrushes, fluoride toothpaste and dental floss can cost hundreds of dollars over a period of several years.

Preventing dental disease is not necessarily the cheapest thing to do in the short run, but to enjoy the highest quality of life over the long run, it is the necessary thing to do. Help your students realize that dental disease is preventable and that parents want their children to avoid unnecessary pain and suffering. This is the reason they are willing to invest large sums of money in their children's teeth.

Procedure:

1. Review the background information with the class, stressing that the cost of brushing and flossing is worth it, since it prevents an expensive and painful condition, periodontal disease.

2. Have the students complete the Brushing and Flossing Math Exercise.

Note To Teachers

In this exercise, the figure of 12 or 14 brushings per ounce of toothpaste is used, however this is a hypothetical number and does not reflect any accurate figures. Therefore, be careful not to teach your students that they get X number of brushings out of a tube of toothpaste. This exercise was only meant to provide an approximate cost of a year's supply of toothpaste and dental floss. By so doing, they will realize that over a period of years their parents are spending a lot of money just on dental floss and toothpaste.

The number of flossing the children can get from a container of dental floss is easier to determine and is fairly accurate, provided they use 18 inches each time they floss.

As the teacher, you should decide the appropriate level at which the students should round of their answers.

Answers to Brushing and Flossing Math Exercise:

1. 51
2. 7.16
3. $15.68
4. 358
5. $784.02
6. 100
7. 3.65
8. $4.71
9. 182.5
10. $235.43
11. 3
12. $3.57
13. $178.50
14. $23.96 $1198.00
15. $700.00
16. $1450.00
17. $7,200.00
18. $9,700.00
19. Surgery
20. $8.250.00
21. Yes
22. 59.5
23. 6.13
24. $14.04
25. $140.40
26. $56.16 $561.60
27. 120
28. 3.04
29. $4.83
30. 30.40
31. $48.34
32. $19.32 $193.20
33. $75.48 $754.80

Brushing & Flossing Math Exercise

Mr. and Mrs. Thompson are both 59 years old and they both have their teeth, but Mr. Thompson must spend a large amount of money if he wants to keep them. He has serious periodontal (gum) disease.

Mrs. Thompson has been brushing and flossing since she was 9 years old. She even started using fluoride toothpaste the very day that it appeared on the market shelves and she has been using it ever since. Her teeth are in excellent shape, because in addition to brushing and flossing, she lived in an area where there was fluoride in the water, she ate sweets only with her meals and she visited her dentist regularly.

The other day, while reading an article about periodontal disease, she discovered that brushing and flossing was one of the best ways to prevent it. She also learned that periodontal disease it the leading cause of tooth loss.

She was curious about how much money she had spent on toothpaste and dental floss the last 50 years. She was also curious about how much money she had saved by preventing periodontal disease.

1. If Mrs. Thompson could brush her teeth 12 times with one ounce of fluoride toothpaste, how many days would an 8.5 ounce tube last if she brushed every morning and night? _____

2. How many tubes of toothpaste would she use in one year? _____

3. If an 8.5 ounce tube of toothpaste costs $2.19, per tube, how much money would Mrs. Thompson spend on toothpaste for one year? _____

4. How many tubes of toothpaste has she used during the last 50 years? _____

5. How much has she spent on toothpaste in the past 50 years? _____

6. Mrs. Thompson buys her dental floss in containers that have 50 yards or 1,800 inches in them. How many days will one container last if she uses 18 inches every morning to floss her teeth? _____

7. How many containers of floss would she use in one year? _____

8. If a container costs $1.29, how much money would it cost Mrs. Thompson to floss her teeth for one year? _____

9. How many containers of dental floss has she used during the past 50 years? _____

10. How much has it cost her to floss her teeth for the last 50 years? _____

11. A toothbrush should be replaced every four months. How many toothbrushes would Mrs. Thompson use in one year? _____

12. If a toothbrush costs $1.19, how much would she spend in one year on toothbrushes?_____

13. How much has she spent on toothbrushes over the past 50 years? _____

14. What is the total amount of money that Mrs. Thompson has spent on toothbrushes, toothpaste and dental floss during the past year? _____ 50 Years? _____

Mr. Thompson was not as diligent as his wife. He did not grow up in an area with fluoride in the water and he seldom brushed and flossed his teeth. As a result, he is faced with a very important decision about his teeth. The dentist told him that he had a serious problem, called periodontal disease. This is a disease of the gums and bone in the mouth, and it is expensive and painful to treat. The dentist told him that he had two choices: 1-He could have all his teeth removed and get dentures; 2-He could have expensive surgery on his gums and bones.

Help him determine how much dentures or surgery will cost.

15. To have dentures made, the dentist will have to remove all 28 of Mr. Thompson's teeth. He will charge $25.00 per tooth. How much will it cost Mr. Thompson to have his teeth removed? _____

16. In addition to the cost of having his teeth removed, it will cost Mr. Thompson $750.00 to buy the dentures. What is the total bill in order for him to get dentures?___

17. Because he has a severe case of gum disease, it will cost Mr. Thompson $2,500.00 for treatment costs and surgery if he wants to save his teeth. In addition, the loose teeth need to be splinted (or attached) to each other. This will cost him $300.00 per tooth. He has 24 teeth that need to be splinted. How much will it cost Mr. Thompson to have the splinting done? _____

18. How much is the total cost to save his teeth from periodontal disease? _____

19. Unfortunately, Mr. Thompson only has two choices regarding his teeth: remove them and wear dentures; or have periodontal surgery. Which do you think he should choose, dentures or surgery? _____

20. What is the difference in cost between these two procedures? _____

21. Do you think that Mrs. Thompson thought all the money she spent on dental floss and toothpaste was a good investment? _____

Your parents have decided that your teeth are important. They have invested money in fluoride toothpaste and dental floss for you and your family. By solving the following math problems, you will have a better understanding that over the years the cost of little things, like toothpaste and floss, add up. Appreciate what your parents do to help you keep your teeth healthy.

22. If you could brush your teeth 14 times with one ounce of toothpaste, how many days would an 8.5 ounce tube last if you brushed every morning and night? _____

23. How many tubes of toothpaste would you use in one year? _____

24. If an 8.5 ounce tube of toothpaste cost $2.29 per tube, how much money would your parents spend for your toothpaste for one year? _____

25. How much would it cost them to buy your toothpaste for 10 years? _____

26. If there were four people in your family, how much would it cost to buy toothpaste for the family for one year? _____ 10 years? _____

27. Your parents buy you a container of dental floss that has 60 yards or 2,160 inches in it. How many days will it last if you floss every morning and use 18 inches of floss each day? _____

28. How many containers of floss would you use in one year? _____

29. If a container of dental floss costs $1.59, how much money would your parents spend on you for one year? _____

30. How many containers would you use in 10 years? _____

31. How much would your parents spend on your dental floss in 10 years? _____

32. If there were four people in your family, how much would it cost to buy dental floss for the family for one year? _____ 10 years? _____

33. How much would it cost your parents to buy a year's supply of toothpaste and dental floss for a family of four? _____ For a 10 year's supply? _____

Extension

1. Carry on a discussion or have your students write a short paper on one of the following topics.

a. Why did Mr. Thompson decide to have surgery rather than dentures, especially when it was more expensive?

b. Why do you want to avoid the pain and discomfort of the problems associated with periodontal disease?

c. If periodontal surgery or dentures were free, would the expense of brushing and flossing every day be worth it? Why?

TOPIC SIX

Nutrition

Program Goal 3.0: To develop an understanding of tooth problems and how to prevent or alleviate these problems.

Background Information

Teeth and gums need the same good nutrition as the rest of your body. Your diet should include a wide variety of foods so that you can receive the necessary nutrients for good health. Foods that provide adequate proteins, carbohydrates, fats, vitamins, minerals and water should be eaten everyday.

If your diet is deficient in a particular nutrient your overall health including the health of your mouth can be effected. Vitamin deficiencies can cause a person's mouth to be more susceptible to the bacteria that cause dental caries and periodontal disease. Although researchers know that poor nutrition does not cause periodontal disease they believe that the disease progresses more quickly and is more severe in individuals whose diet does not contain the needed nutrients. To make sure that you are getting enough nutrients for good general and oral health items from the four basic food groups should be eaten every day. Four-four-three and two is a formula to remember for good health. Your daily diet should include at least four servings of fruit and vegetables four servings of bread and cereals, three servings of milk and dairy products and two servings of meat, fish or eggs.

Besides the need for nutrients there are other factors of your diet that must be considered for dental health. Your eating patterns and food choices can be important factors in how much tooth decay you develop. When you eat foods that contain carbohydrates the bacteria in plaque feed on sugars and starches and produce acids that can cause tooth decay. All types of sugars including those found in natural foods like honey and fruit can cause tooth decay. Starches which are a type of carbohydrate found in breads, crackers, and cereals also contribute to decay. Examples of sugars include sucrose, fructose (fruit sugar)
glucose, lactose (milk sugar) and maltose (grain sugar).

The amount of carbohydrates found in a food is only one of the factors that determines its effects on the teeth. Other factors include:

- The frequency of eating. Every time you eat foods the teeth are attacked by acids for twenty minutes. The more often you eat these foods the more acid attacks you have. *
The physical characteristics of the food. Foods that are sticky or chewy cling to the teeth. As long as these foods remain in the mouth the bacteria in plaque continue to produce decay causing acids.
- The time needed to eat the food. Avoid foods such as hard candies and cough drops which stay in the mouth and bathe the teeth in sugar. During this time the teeth are attacked by acids.
- When the food is eaten. Eat sweets only with meals. More saliva is present in the mouth at mealtime and this helps neutralize the acid production.
- To have a diet that promotes good dental health it is important to have sensible eating habits. This involves eating meals that are well balanced limiting snacking and eating foods that contain sugars at mealtime.

6-A. TASTING PARTY

Objectives: The student will identify foods which are good for the teeth and body.

Grade Level: K-6

Materials/Preparation:

various foods
plates
napkins
toothpicks, spoons

Procedures:

I . This is an effective way to introduce students to a variety of non-sweet foods that make delicious snacks. You can limit the party to fresh fruits and vegetables or include other foods such as popcorn, nuts, plain yogurt (can also be used as a dip for vegetables), cottage cheese, tuna fish, meat cubes, pickles, whole-wheat crackers. Try to include foods that students have probably never tasted. Asking parents to help prepare the party foods will make your job easier.

Extensions:

READ THE FOLLOWING TO YOUR STUDENTS

As a child I was told that cavities could be prevented by brushing after every meal, avoiding candy and seeing the dentist twice a year. This message was conveyed to me consistently and persistently by my dentist, my teacher and my family. My older sisters especially relished every opportunity they could find to say, " That candy is going to give you cavities, silly!"

Well, I didn't follow any one of these three rules very well, so when I was sent to the dentist at age eight and received twelve fillings for my trouble, I figured my silly behavior had simply given me the expected results. I believed the three rules were true, but I still didn't follow them.

Times change. Twenty-five years later I was giving my son the same three rules to follow, but a fourth rule had been added-"Use fluoride in your toothpaste and in a daily tablet." My son didn't follow those three rules very well either, but the fourth rule was a different story. When he was sent to the dentist at age eight he received a fluoride treatment and a pat on the back for his trouble. My son does not believe in those three rules anymore, but he feels that fluoride will prevent cavities for sure.

Who is correct about the value of those rules for preventing cavities? In fact, neither of us knows because neither of us really gave them a chance to work. The fact is that a modified form of each rule is still recognized as essential to long term dental health.

Good nutrition, which is the modern form of the rule of sugar avoidance, is the unsung hero of the war against dental disease. The benefits go far beyond simply preventing cavities. Gum disease, malocclusion, size of teeth, and appearance of the teeth are all affected by specific nutritional factors as summarized on the next page:

NUTRITIONAL FACTOR	DENTAL IMPORTANCE
Carbohydrates	Increased growth of plaque
Dietary Protein	Salivary gland development (decreased saliva increases cavities)
Ascorbic Acid (Vitamin C) and Folic Acid	Essential to tooth formation and gum tissue development
Vitamin A	Deficiency causes malformed tooth enamel and small tooth size
Various Minerals	Affect acid solubility of the enamel
Fluorides	Deficiency leads to tooth decay

A good diet during growth and development of the teeth, from birth to age 14 can assure well formed teeth resistant to decay. Daily fluoride, in the proper amounts, is an essential part of this developmental stage. Once the tooth appears in the mouth, good saliva flow is important to carry minerals to the immature enamel, including calcium, phosphorous, chromium, copper, nickel, strontium and fluoride, all of which contribute to the resistance of the enamel to bacterial acids.

By about age fifteen, the teeth are in place and the enamel has matured. The tooth is now at the mercy of the hostile oral environment for the next sixty years or so. Nutrition plays a central role in protecting the tooth during this time.

The tooth is continuously attacked by acid formed by bacterial plaque, primarily streptococcus mutants. The plaque may be removed by brushing or flossing, but returns within 24 hours and may successfully hide from the brush and floss. The tooth enamel is always dissolved somewhat by the acid, but the saliva reverses the process by providing minerals to remineralize the tooth. When this battle tilts in favor of the plaque a cavity forms and becomes irreversible. At this point a visit to the dentist is required to intercept the decay before it can destroy the tooth.

Thus it can be seen that nutrition is the common thread running through all dental preventive methods. We starve the plaque by cutting down on the frequency of sugar exposures. We eat fibrous foods to stimulate saliva flow which increases removal of sugar from the mouth as well as increasing remineralization of dissolved enamel. We remove the plaque to give the saliva more time to tip the scales in the mineralization battle. We use fluoride to inhibit the bacterial plaque and speed up remineralization. We visit the dentist to make repairs when the battle is going against us. Most importantly we attend to our state of oral hygiene and general nutrition in order to keep our oral tissues healthy and resistant to the disease process.

Who is correct about those three rules for preventing cavities? I am, of course, providing we are referring to the new and improved version.

1. Brush and floss daily to remove plaque and maintain the health of gums.
2. Practice good nutrition, including proper use of fluorides and reduced frequency of sticky carbohydrate consumption.
3. Visit the dentist regularly for preventive and reparative procedures.

6-B. DIET DIARY

Objective: The student will identify foods which are good for the teeth and body.

Grade Level: 3-6

Materials/Preparation:

Diet Diary worksheet
magazines
paper plates
paste/glue

Procedures:

1. DAY 1: Using the Diet Diary worksheet have the students keep a food diary of all the food they have eaten for three days.

2. DAY 3: Have the students exchange diaries with a neighbor and then have each make an "X" next to those foods with sugar. Return diaries to their owners. Ask children: "Do you agree with the marks?" Discuss why the foods were or were not marked with an"X". Discuss the role sugar plays in dental decay. Discuss foods that could be substituted for the sugary foods. Ask children to choose snack foods that do not contain added sugar and have them keep another food diary for two more days.

3. DAY 5: Exchange diaries with a neighbor, have the children mark an "X" next to the foods with sugar. Ask them to compare the number of checks on the first and second diaries. As a homework assignment have the children cut out pictures from magazines of non-sugary foods and let them plan a meal. Have the children paste the pictures on a paper plate and bring their meal to school.

DIET DIARY

NAME:	DATES YOU KEPT DIARY:					
LIST EVERYTHING YOU EAT & DRINK FOR:	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	BRUSH
BREAKFAST						
SNACKS						
LUNCH						
SNACKS						
SUPPER						
SNACKS						

TOPIC SEVEN

Smokeless Tobacco

Program Goal 3.0: To develop on understanding of tooth problems and how to prevent or alleviate these problems.

Background Information

Dipping snuff and chewing tobacco are habits that are gaining popularity all over the country especially among male high school and college students. Junior high and elementary schools are also experiencing a rise in its usage. Smokeless tobacco seems to be affecting all ages. Children are exposed to advertisements which in a subtle way are telling them. "If you want to be a man, then you better use smokeless tobacco."

An ex-Dallas Cowboy and rodeo star, tells young boys that smokeless tobacco ". . . is tobacco you can enjoy without lighting up and smoking. (Implying that smokeless tobacco is safe when compared to cigarette or pipe smoking.) It must be remembered, however, that there are no safe alternatives to smoking other than quitting.

In this advertisement, he goes on to describe the enjoyment one can get from smokeless tobacco. . . "take a small pinch in your thumb and forefinger, and put it between your cheek and gum. Leave It there. No need to chew. The tobacco slowly releases its great flavor giving you real satisfaction". "Going smokeless" takes some getting used to but that is part of the fun. "At first you could feel a slight irritation on the gum, and the tobacco may move around your mouth more than it should; and you might work up too much saliva. But learning is part of the fun and these things pass with practice. Two weeks should make you a "pro" he said. Later in the ad he offers a free can of mild tobacco just to help someone get started. A coupon has the following exclusion in very small print, "Offer not available to minors". However, there is no way of determining whether it was an adult or minor who sent in the coupon.

A tobacco chewer is stereotyped as a macho man who is always having fun, is athletic, handsome, and surrounded by beautiful women. In a subtle way, the ad is teaching children that real men are users of smokeless tobacco while nonusers are not. Students should be taught that sometimes it takes more courage to do what they want to do than to follow the crowd.

THE FOLLOWING FACTS ABOUT SMOKELESS TOBACCO SHOULD BE STRESSED:

1. The most serious health hazard associated with smokeless tobacco is oral cancer. Closely associated with this cancer is a condition known a leukoplakia. Leukoplakia is a term used to describe a leathery-appearing area in the mouth. It can be a "smooth, white patch or a thick hardened, and wrinkled lesion." It is most frequently caused by repeatedly holding tobacco in one location in the mouth while sucking it. Leukoplakia is considered to be pre-cancerous. The experts aren't sure how long it will take for cancer to develop in such an area or whether it ever will. Evidence suggests that 3% to 5% of the leukoplakia associated with smokeless tobacco becomes malignant.

2. Gums tend to recede from the teeth where tobacco is held in the mouth and as this happens the exposed roots become highly susceptible to tooth decay as well as sensitive to hot and cold.

The advanced periodontal, or gum disease, that occurs as a result of using smokeless tobacco is irreversible, thus placing the teeth in jeopardy. As teeth lose their gum and bone support, they have a tendency to drift from position, loosen and eventually may have to be removed.

3. All forms of smokeless tobacco contain high concentrations of chemicals which may cause cancer. These carcinogens are formed during the curing and processing of tobacco and have been shown to increase the risk of cancer of the oral cavity. The longer a person has chewed, the greater are his chances of developing some type of cancer of the mouth.

4. Besides causing damage to the gums, users of smokeless tobacco also have a higher incidence of tooth abrasions (wearing away of the tooth's biting surfaces.) This is caused by an unusually high amount of fine sand and grit which was not completely removed when the tobacco was processed.

5. Nicotine is found in all cured tobacco, which produces a dependency in those who use it in any form. Therefore, there is a strong possibility that tobacco chewers will develop a habit similar to smokers that can be difficult to break.

Nicotine is a drug that is readily absorbed through the lining of the mouth of a user of smokeless tobacco and it acts as a stimulant on the body's nervous system. Like other stimulants, its initial effect is stimulation or euphoria followed by a let down or psychological depression. In order to get back up, people addicted to nicotine feel a need for more every 20 to 30 minutes while awake.

Nicotine also causes other changes in the normal body functions, such as: constricting the blood vessels, increasing the heart rate, and increasing the blood pressure.

6. Today's society places a lot of importance on white teeth and pleasant breath. Users of smokeless tobacco, on the other hand, frequently suffer from bad breath as well as discolored teeth.

There is no obvious way for a polite person to accommodate the need to spit tobacco juice every few minutes without offending others.

Objective: The student will infer from class discussions the effect of smokeless tobacco on oral health.

TOPIC EIGHT

Malocclusions

Program Goal 3.0: To develop an understanding of tooth problems and how to prevent or alleviate these problems.

Background Information

Malocclusion may be defined as irregularities in tooth or jaw position which can cause the upper and lower teeth to come together improperly.

Malocclusions are caused by hereditary or environmental factors. Hereditary factors include large tooth size, small jaws, incorrect jaw positions or muscle abnormalities. One or more of these factors are the primary cause of most malocclusions. Environmental factors include such things as premature loss of primary teeth, early loss of six year molars, mouth breathing, tongue thrusting, fingernail biting and thumb sucking. Bad habits can cause teeth to move in the wrong direction so these habits must be corrected before orthodontic treatment can succeed.

Early loss of primary teeth deserves special mention since it is a direct result of neglect and can easily be prevented. The attitude that "baby teeth" are not important is a mistake that subjects a child to unnecessary infections, toothaches and frequently results in a need for costly correction later.

Preventing decay and restoring primary teeth will usually help a malocclusion from developing. The fluoridation of water supplies or using a daily fluoride supplement, along with good oral hygiene habits, can prevent a high percentage of teeth from decaying. If a primary tooth is lost, an inexpensive space maintainer can still prevent some malocclusions. If a permanent tooth is lost, it should be replaced to prevent the movement of adjacent teeth.

Swallowing is such a basic movement we generally do it without thinking about how to do it. However, there is a right and a wrong way to swallow! If your tongue does not touch the roof of your mouth and if your teeth are not together when you swallow, YOU DO NOT SWALLOW CORRECTLY. Incorrect swallowing is the cause of many malocclusions. If teachers notice a problem with a child's speech or swallowing pattern, this should be evaluated professionally at an early age. Over ten percent of all children swallow incorrectly and it is very destructive to teeth if one swallows incorrectly.

Children should have a clinical examination by a general dentist to determine any potential problems before they start kindergarten. This practice should be encouraged for many reasons. (If necessary,) early orthodontic consultations can be accomplished at any age but usually the child is ten years of age or older before treatment will begin.

8-A. DON'T LEAN ON ME

Objective: The student will recognize and describe malocclusions.

Grade Level: 2-4 **Materials/Preparation**
none

Procedures:

1. Pick 10 students to represent teeth in the lower jaw. Have them form a semicircle showing the correct position of the primary teeth. Ask one student to step out and have the other demonstrate how the surrounding teeth could lean toward the space. Discuss how a dentist could treat such a problem with a space maintainer.

2. Replace the missing tooth and have another student role play a cracked or out of place tooth. Demonstrate how this might affect the other teeth.

3. Introduce the term malocclusion and discuss the role of an orthodontist.

Extensions:

1. Invite an orthodontist to visit the class and give information on malocclusions and possible treatment methods. The yellow pages of the local telephone book will usually list orthodontists under the heading entitled "dentists".

2. Obtain plaster casts of crooked teeth from an orthodontist for classroom display.

TOPIC NINE

Accidents

Program Goal 3.0: To develop an understanding of tooth problems and how to prevent or alleviate these problems.

Background Information

Accidents occurring during play are the most frequent causes of injury to the teeth. Accidents at drinking fountains, injuries from thrown objects, and falls from stairs and bicycles all take a heavy toll on the anterior teeth. Home accidents and automobile accidents also have a share in these injuries. Certain careless activities of children often contribute to fractured teeth. Some of these activities are biting on objects such as bottle caps, thread, cracking nuts, chewing ice, chewing pencils and opening bobby pins. "Horse play" such as shoving, pushing, tripping, jostling in hallway, playground, or buses, can also injure teeth.

Many dental accidents can be prevented. Accident prevention includes: proper supervision of activities and games, proper use of equipment during games, appropriate use of helmets with face masks and mouth guards, courtesy and consideration by everyone and avoidance of potentially hazardous situations.

Eighty percent of all fractured teeth occur in children, with boys suffering more than girls. Unlike most other parts of the body, teeth have a very limited ability to heal themselves when injured. Therefore, if injury does occur, prompt action and intervention are necessary to avoid permanent damage and disability. The following first aid techniques are suggested for the given type of oral emergencies:

Objects wedged between the teeth: Use dental floss to try to remove the object. Never force the floss between the teeth as this may cut the gums. Do not use anything sharp or pointed to try to remove the object. If you can't get it out easily, go to a dentist.

Bitten tongue or lip: Apply direct pressure to the bleeding area with a clean cloth or a tea bag. If there is swelling present, apply cold compresses. If the bleeding does not stop, seek professional help.

Knocked out tooth: If a permanent tooth is knocked out, save the tooth. **Do not clean the tooth. Do not touch the root of the tooth.** If the person is old enough, have him hold the tooth under his tongue until he arrives at the dentist's office. If not, wrap the tooth in a clean, wet cloth, or place it in cool water or milk. Get the victim to a dentist within 30 minutes, if possible. A tooth may be successfully replaced in the socket up to two hours after the injury, but the sooner the better.

Broken tooth: Clean any dirt from the injured area with a clean gauze pad and warm water. Place a cold washcloth on the face over the injured area to minimize swelling. Go to a dentist.

Braces and retainers: If a wire breaks and becomes embedded in the cheek, tongue, or gums, **do not attempt to remove it.** Go to a dentist. If a wire is causing irritation, cover the end of it with a bit of paraffin wax or a cotton ball. Go to a dentist.

Toothache: Rinse the mouth with warm water and use dental floss to clean out any food that might be trapped between teeth. If there is swelling, place a cold compress to the face over the area. **Never place aspirin on teeth or gums.** Go to a dentist.

9-A. A TOOTH FOR A TOOTH

Objective A: The student will describe actions to be taken in the event of a tooth injury.

Objective B: The student will identify ways of preventing accidental tooth injuries.

Grade Level: K-6 Materials/Preparation:
None

Procedures:

1. Begin the activity by asking students if they have ever broken or bumped a tooth. How did it happen? How did it feel?

2. Make a list of ways accidents to teeth can happen. Discuss each. The list may include:
   Tricycle and bicycle accidents
   Thrown ball bats
   Hit in mouth with swing seat
   Teeter-totter accidents
   Tripping on objects on the floor
   Car accidents (no seat belt on)
   Hard object in mouth
   Chewing ice or hard candy

3. Develop a class list of dental safety rules. Have them typed up and distributed to the entire school.

4. Have students role play the situations listed below.

Knocked Out Permanent Tooth

Rinse the tooth off, but don't scrub it. Place the tooth back in the tooth socket, or in a glass of milk, or a clean wet cloth. Go to the dentist immediately.

Bitten Tongue or Lip

With a clean cloth, apply pressure to the bleeding area. Apply cold if swelling occurs. If bleeding does not stop, go to a hospital emergency room.

Broken Tooth

Clean dirt from area with warm water. Place cold cloth on face next to injured tooth to control swelling. Go to the dentist.

1. Have students draw pictures that illustrate how teeth can be injured.

2. Invite a former or present football player or coach into the classroom to tell how tooth injuries are prevented in sports.

Extensions: (Grades K-3)

1. Students are to complete the Dental Health Safety Worksheet (Page 91). Discuss what to do to for emergency care.

2. Go on the safety stroll in the classroom, building and around the playground. Use sight, smell, touch and hearing to develop safety sense in recognizing hazardous situations and what can be done to make them safe.

3. Talk about/act out safety situations.

4. Draw safety posters with the students for class.

Extensions: (Grades 4-6)

1. Go on a safety stroll (see above). With red and green cut out dots the students can "mark" the stop/hazard, and go/OK situations. Talk about making unsafe situations safe, the playground. Use sight, smell, touch, and hearing to develop safety sense in recognizing hazardous situations and what can be done to make them safe.

2. The Oral Emergency Worksheet (Page 92) is for the students to complete. Discuss emergency actions.

3. Assist the class in developing a poster with safety rules listed and illustrations for the playground and/or school building.

4. Talk about or act out safety rules for bike riding, playing baseball, riding in a car. Include discussion about various special equipment that might be used (mouth guards, helmets, etc.).

Key to fill in Oral Emergency Worksheet

1. washcloth	2. aspirin	3. teeth	4. floss	5. pushing, shoving
6. courteous	7. accidents	8. 30	9. helmets	10. fun, safe

True or False Answers

1.	false	2.	false	3.	false	4.	true	5.	false
6.	false	7.	false	8.	false	9.	true	10.	true

Put an X under the pictures of activities unsafe for the teeth

Name: _____

ORAL EMERGENCY WORKSHEET

Fill in the blanks in the following sentences.

1. Put a cold _____ over an injury to help stop swelling.
2. Do not put _____ on teeth or gums to stop toothache pain.
3. _____have a hard time healing themselves after an injury.
4. If you force _____ between the teeth, it may cut the gums.
5. _____ and_____ could cause serious accidents.
6. Be a _____ game player to prevent accidents.
7. _____ can be prevented.
8. If possible, get someone with a knocked out tooth to a dentist within _____ minutes after an accident.
9. _____ protect the face, mouth and head in case of a bicycle accident.
10. Have a_____ and_____ summer!

Word Bank: Not all of the words will be used.

helmets	30	safe	aspirin	teeth	pushing	floss
90	children	washcloth	courteous	steak	shoving	
accidents	fluoride	fun				

True or False?

1. If you cannot place a knocked out tooth back into its socket (in your mouth) just stick it into your pocket.
2. Objects wedged (caught) between the teeth should be removed with a toothpick.
3. Mouth guards help to correct malocclusions (teeth that do not close together the correct way).
4. A tea bag will help stop bleeding when it is put on the injured place.
5. Dental floss can be used to fix broken wires on braces.
6. A fluoride tablet will help stop the pain of a toothache.
7. If a permanent tooth is knocked out, boil it in milk to kill germs.
8. A dentist will give you a helmet to protect you from dental accidents.
9. If you are courteous in a game, you are a winner.
10. Safety each day, will help keep accidents away.

An Oral First Aid Kit

Make an oral first aid kit for your school. Put into it the following items to use in case of dental emergencies:

Dental Floss-use to remove objects from between teeth

Small Gauze Pads or Cotton or Both-use to press against a bleeding injury

Clean Cloth-use to wrap a tooth that has been knocked out, do not wash the tooth
Ice Pack or Wash Cloth (cold and wet)-the coldness will help stop swelling of an injury

Paraffin Wax-use to place over the end of broken wires on braces or a chipped tooth to stop irritation of cheeks or gums

Tea Bags-press a wet tea bag on a bleeding injury to stop the bleeding

25 cents for an Emergency Phone Call-remember to give your name, where you are, and the kind of injury you received. 911 is a free call, but you need 25 cents to call a dentist.

Name and Phone Number of the Dentist-write it down because you may forget it in an emergency.

9-B. TOOTH INJURIES

Objective: The student will identify ways of preventing accidental tooth injures.

Grade Level: 2-5 **Materials/Preparation:**
3 worksheets

Procedures:

1. Read the following story to the class. Ask them to listen to discover how Timmy took care of his teeth.

TIMMY THE TWO-TOOTHED MUSICAL MOUSE

Hello! My name is Zack and I have a story to tell. It's about my best friend, "Timmy The Two-Toothed Musical Mouse".

I wish you could meet Timmy. If you could meet him you would like him. He is a gray mouse, with a long tail, short whiskers, big brown eyes, small ears, a little nose and no teeth, except for two front teeth that rest on his lower lip.

Timmy got his nickname "The Two-Toothed Musical Mouse" because his two front teeth tinkle. "That's impossible," you say and I would agree except I have heard them. Whenever he opens his mouth, air rushes in, hits his tonsils, bounces off and hits the back of his two teeth. This causes the tinkle.

The tinkle will always be there. There is no way to stop it, unless he can get someone to make him a set of false teeth. Unfortunately, there is no such thing as false teeth for mice.

Our music teacher wanted Timmy to use his teeth as a musical instrument and play in the school band. I can picture him introducing Timmy at a special concert. "Ladies and gentlemen, I'd like to introduce Timmy and his musical teeth. He will play his favorite song 'Without My Teeth I Feel Like Crying'. "Timmy never got a chance to play that tune, because he couldn't read music. So he quit the band.

Timmy's biggest problem with musical teeth is that people can't understand him when he talks because it sounds like his mouth is always full of crackers. People have to guess what he is trying to say, and they usually guess wrong. For example, a couple of weeks ago he went into a restaurant and ordered a hamburger, french fries, and a glass of milk. The waitress misunderstood and brought him a glass of milk mixed with root beer, a raw egg, and an Alka-Seltzer.

Last week he took his suit to the dry cleaners and told them he wanted it cleaned and pressed. When he picked it up, the sleeves had been cut off and the buttonholes sewed up. Yesterday, he went to the doctor to have a sore whisker trimmed. Instead the doctor put a cast on his tail. These things wouldn't have happened if Timmy had all his teeth.

Most people think Timmy lost his teeth because he didn't take care of them, but this just isn't true. At one time he had the healthiest and prettiest teeth in the entire school. He was proud of them, and he treated them like they were his best friends. In fact, he took such good care of them that he didn't have a single cavity. He always tried to eat the right foods. He drank his milk everyday, and along with it he liked to eat a grilled cheese sandwich. He thought he was getting a treat if he could eat a big juicy, crispy, red apple. He always ate his vegetables without complaining, and he swallowed his fluoride tablet every day.

Every morning he would eat a good breakfast. Afterwards he would hurry to the bathroom to brush and floss his teeth. He knew this was necessary if he wanted to prevent decay.

Timmy went to the dentist regularly to have his teeth cleaned, checked, and treated with fluoride. He did everything he was supposed to do to keep his teeth healthy.

Timmy enjoyed learning about his teeth. Whenever his teacher talked about dental health, he would listen very carefully. "If you want to keep your teeth healthy, then you must eat good food, cut down on your sugary snacks, brush and floss daily, use fluoride each day, and visit your dentist," she said. Timmy did all of those things, but he still has only two teeth.

I'll bet you a cheese ball that you are wondering why he lost his teeth. Aren't you? He would probably still have them, except he had an accident while playing football.

He played tight end on his school team and he loved it. He practiced hard and he played hard. He was good. He knew it and so did the entire team. Timmy loved the thrill of catching a pass. He wanted the quarterback to throw to him on every play.

The accident happened in the third quarter of the championship game. In the huddle the quarterback called a pass play to the tight end. Timmy was excited. "Hurry and snap the ball," he thought to himself. "Maybe I can make a touchdown with this one."

The ball was snapped; the quarterback faded back; Timmy ran towards the end zone. He was open; the quarterback spotted him and threw the ball. It was slightly overthrown, so Timmy had to jump for it, but so did two defensive backs. All three were fighting for the ball when an elbow hit Timmy in the mouth. He fell to the ground, landing on the other player's shoe. When he stood up he saw his teeth lying on the ground. All except two were knocked out.

He picked up as many as he could find and ran to his dentist, who tried to save them. Unfortunately, they were too badly damaged. Timmy felt terrible about his teeth. "I can't believe I lost my teeth this way," he kept telling himself. "I might have lost them if I didn't take care of them, but not by playing football. What a terrible waste!" Timmy could have protected his teeth if he had used the proper safety equipment. But he wasn't wearing a helmet, and he refused to use the mouth guard. Now he knows that safety rules are made to protect us and to prevent injury.

Before his accident. Timmy didn't realize how easily teeth could be damaged. After his accident, he started counting the number of friends who didn't follow safety rules. Some of them had also damaged their teeth as a result of it. One of his friends was hit in the mouth with a snowball and lost a tooth. A boy down the street broke two teeth because he was riding his bike with no hands. A classmate opened a pop bottle with his teeth and snapped a tooth in half. A girl in another class had three knocked out because someone pushed her while she was getting a drink.

If Timmy could talk, I think he would tell you, "If you want to keep your teeth you must brush and floss, visit the dentist, eat right, cut down on your sugary snacks, use fluoride and be careful when you play. Remember, an accident can ruin your teeth, so obey all the safety rules."

Someday someone might make a set of false teeth for Timmy but until then he will be known as "Timmy The Two-Toothed Musical Mouse."

Extensions:

1. Discuss accidents students have had with their teeth.
2. Discuss the story.
3. Distribute and do the Secret Message worksheet (Page 76). What was Timmy's secret message?

Answer: (If you want to keep your teeth you need to brush and floss, visit the dentist, eat right, use fluoride, and be careful when you play. An accident can ruin your teeth, so obey all safety rules.

4. Do the Crossword Puzzle worksheet (Page 98). **Answers:** (**Down:** 1. vegetables, 2. bicycle, 3. dentist, 4. apple, 5. teeth, 6. talk, 7. floss. 8. brush. **Across:** 1. accident, 2. push, 3. breakfast, 4. snowball, 5. mouse, 6. cheese, 7. fluoride, 8. safety, 9. milk.)

5. Discuss and complete the How to Prevent Broken Teeth worksheet (Page 99). Send the completed worksheet home with students.

WORKSHEET: Timmy's Secret Message.

NAME_____

Instructions: Decode Timmy's Secret Message by using the secret code below.

TIMMY'S SECRET MESSAGE

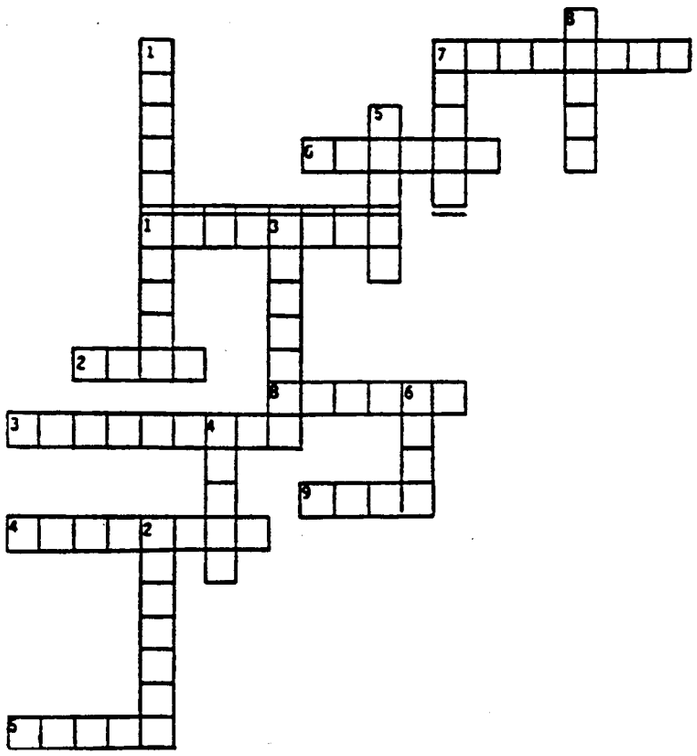
"18	21	2	12	6	4	26	13	7	7	12	16	22
22	11	2	12	6	9	7	22	22	7	19	2	12
6	13	22	22	23	7	12	25	9	6	8	19	26
13	23	21	15	12	8	8,	5	18	8	18	7	7
19	22	23	22	13	7	18	8	7,	22	26	7	9
18	20	19	7,	6	8	22	21	15	6	12	9	18
23	22,	26	13	23	25	22	24	26	9	22	21	6
15	4	19	22	13	2	12	6	11	15	26	2.	26
13	26	24	24	18	23	22	13	7	24	26	13	9
6	18	13	2	12	6	9	7	22	22	7	19	8
12	12	25	22	2	26	15	15	7	19	22	8	26
21	7	2	9	6	15	22	8."					

SECRET CODE

a-26	g-20	n-13	u-6
b-25	h-19	o-12	v-5
c-24	i-18	p-11	w-4
d-23	j-17	q-10	x-3
e-22	k-16	r-9	y-2
f-21	l-15	s-8	z-1
	m-14	t-7	

WORKSHEET: Timmy's Crossword Puzzle

NAME _____



DOWN

1. Timmy's Mom gave him carrots, lettuce, and other _____ to eat and he ate them.
2. One of Timmy's friends fell off his _____ and broke two teeth.
3. Timmy went to the _____ regularly to have his teeth cleaned, checked, and polished with fluoride.
4. Timmy thought he was getting a treat if he could eat a big, juicy, crispy, red _____
5. Timmy lost his _____ in an accident.
6. Because Timmy only had two teeth, it was hard for him to _____ and be understood.
7. Before Timmy's accident, he would brush and _____ every day.
8. Timmy's teacher told his class to _____ and floss their teeth if they wanted to keep them.

ACROSS

1. Timmy lost his teeth in an _____ while playing football.
2. A girl in Timmy's school was getting a drink from the water fountain and someone gave her a little _____ and it knocked out three teeth.
3. Every morning he would eat a good _____
4. One of Timmy's friends lost a tooth after being hit in the mouth with a _____
5. Timmy's nickname is "The Two-Toothed Musical _____
6. Timmy drank his milk every day and along with it, he liked to eat grilled _____ sandwiches.
7. The dentist put _____ on Timmy's teeth.
8. Timmy said, "Remember an accident can ruin your teeth so obey all the _____ rules.
9. Every day Timmy drank a big glass of _____

WORKSHEET: How to Prevent Broken Teeth

NAME _____

Instructions: Pick one of the ways to prevent broken teeth and draw a picture about it at the bottom of the page.

Football: Wear properly fitted mouth guard and helmet.

Baseball: Wear a catcher's mask while receiving pitched balls.

Ice skating: Do not push or trip other skaters. Wear a mouth guard while playing hockey.

Roller skating and Skate Boarding: Keep your skates or skateboard under control. Never 'hitch' rides. Wear a helmet. Do not go 'too' fast.

Swimming and Diving: Use the ladder to climb out of a pool. Do not run or push.

Tree Climbing and Jungle Gyms: Never climb when wet. Be sure of your footing at all times. Use two hands.

Playground: Do not push, shove or trip playmates.

Bicycling: Be careful in rainy weather. Wet roads and wet leaves are especially dangerous. Wear a helmet.

Basketball: Wear mouth guards especially in rough games.

Boxing: Always wear a mouth guard.

Running Games: Never trip or upset another player during play. Be careful of dangerous objects.

Riding in Cars: Be aware of sudden stops. Wear a seatbelt.

Drinking Water: Do not hit, push, or throw at a person while he/she drinks from a container or fountain.

Swinging: Remain seated. Do not jump from or walk under a moving swing. watch out for tree and other things in your path.

Hill Climbing: Go with an experienced climber. Test firmness of rocks and footing.

Sledding: Watch out for trees or other objects in your path.

TOPIC TEN

Dentistry Yesterday, Today, and in the Future

Program Goal 4.0: To put today's dentistry into a historical perspective.

Background Information

Dentistry has been a progressive health profession and one of its most recent significant breakthroughs is its ability to prevent dental decay. For the first time in history, many of today's children can go through life without ever having a cavity or feeling the pain of a toothache if only they learn and use the "secret" of prevention. The most important "secret" of prevention lies in the proper use of fluoride, as discussed in Topic 4.

Fluoride is most effective on smooth surfaces. Consequently, it offers little protection to the chewing or biting surfaces of the molars. Modern research has now developed a material that will protect the biting (occlusal) surfaces of the back teeth, where 50% of all tooth decay occurs. The material is called a pit and fissure sealant. The biting surfaces of the molars have dimples and grooves that are known as pits and fissures. This part of the tooth is more susceptible to decay because food can be trapped there. Brushing is partially ineffective in preventing decay in this area because the pits and fissures are microscopic in size and a single toothbrush bristle is even too large to fit down into them in order to clean out the trapped food and bacteria.

A sealant is a plastic resin which is placed on the chewing surfaces of the back teeth. Its purpose is to prevent the decay-causing bacteria from creating cavities by effectively eliminating their hiding places in the pit and fissures. Sealants are extremely effective in preventing pit and fissure decay and by combining them with the use of fluorides, nearly all tooth decay can be prevented. They are applied by a dentist or dental hygienist without any drilling of the teeth when the first permanent molars erupt at an age of about 6-7 and then again at age 11-12 when the second permanent molars appear.

Dental practice in the future will be considerably different from today's dentistry as modern research rapidly changes the profession. Much more emphasis will be placed on prevention, thus sharply reducing the need for dentists to practice as we know it today.

The goals of the intensive dental research programs being conducted now in this country are to eradicate dental decay, much like scientists eliminated smallpox. The efforts of hundreds of researchers are paying off as is evidenced by the fact that today over forty percent of America's school children are completely free from cavities. The prevalence of dental decay in the remaining school children has been cut in half.

Some of the more exciting areas of dental research that may impact on children in the future include:

1. **VACCINE AGAINST DENTAL DECAY:**
Progress is being made that will allow infants to receive an oral vaccine that combats cariogenic (decay-causing) bacteria. Hopefully, this will help babies to develop an immunity against dental decay by the time their teeth begin erupting. This is a very new area of research but one which has much potential.

2. **FLUORIDE RELEASING SEALANTS:**

Researchers are working on a sealant that gradually releases fluoride. This will add extra fluoride protection. Those children at high risk for developing dental caries will especially benefit from this development. It is interesting to note that about 20 percent of our children have 80 percent of the tooth decay seen in the United States.

3. **PERIODONTAL (GUM) DISEASE RESEARCH:**

Periodontal disease is the leading cause of tooth loss and it actually begins at a relatively young age. Research is studying possible methods of preventing plaque from adhering to the teeth. Antimicrobial and antiplaque agents that will eliminate many of the pathogens of periodontal disease has now been developed.

4. **DENTAL COMPOSITES:**

Many new materials to replace amalgam (silver) fillings have recently been developed. Some of their advantages are that they require less drilling and can be matched to the natural tooth color so they have an aesthetic value.

5. **SLOW RELEASE DEVICE THAT INCREASES FLUORIDE IN PLAQUE AND SALIVA**

A bean shaped object made from a plastic similar to the plastic used in soft contact lenses has been attached to molar teeth. This object contains fluoride and slowly releases it into saliva providing a topical as well as a systematic protection similar to what would be received if one were drinking fluoridated water. This approach to daily fluoride would require less effort and ensure a higher compliance as parents would not have to remember to give their child a daily tablet.

6. **DIAGNOSING EARLY TOOTH DECAY:**

Research is being done to detect tooth decay before any discernible sign is visible. If such a diagnostic procedure is developed, dentists will be able to treat the tooth before any permanent damage to it occurs.

It is an exciting time for dentistry. Advancements are being made which allow us to keep our teeth healthy. There is no reason for our children to suffer the loss of their teeth. However, it has been said, "There is nothing the dentist can do to undo what the individual will not do." In other words, the greater responsibility for keeping our teeth and gums healthy belongs to each of us. Our dentist can warn us, our teacher can inform us, our parents can encourage us, but we must put forth the effort to do what must be done to keep our teeth healthy.

10-A DENTAL HISTORY

Objective: The student will develop an appreciation for dental history.

Grade Level: 2-4 **Materials/Preparation:**
None

Procedures:

Read and discuss the following information on dental history using the discussion questions that follow. Try to develop appreciation for the capabilities of modern dentistry.

The History of Dentistry

No one knows who the first dentist was or when he lived. It is conceivable that the first dentist was a friend of someone who was troubled by a toothache and helped alleviate the pain by using a primitive chisel to knock out the aching tooth.

For thousands of years man has blamed toothaches on evil spirits or offended deity, so the first dentist may have been a medicine man who practiced magic or a tribal religious leader offering a sacrifice to an offended god.

Eventually, people began searching for something other than magic to relieve a toothache, so they started experimenting with various materials and substances that they hoped would bring them relief. They tried herbs, animal tissue and offensive smells, usually aimed at driving evil spirits out.

They had all sorts of reasons, based on superstitions and ignorance, for doing what they did. Bad smelling mixtures were used as a means of offending the evil spirits and thereby driving them out of the aching tooth. A useless remedy would be tried, and if by some chance the pain disappeared, credibility was immediately gained. People didn't consider the possibility that it could have been a coincidence, a freak happening that was unrelated to the useless remedy.

Dental progress and knowledge have evolved slowly, taking thousands of years to reach the point we are at today. The evolution of dentistry is fascinating. For example, an early Egyptian dentist might advise his patient to treat a toothache by splitting a mouse in half and rubbing it over the aching tooth. A Greek dentist living in the fifth century B.C. would use a mouse in a prescription for curing bad breath.

A dentist living during the Middle Ages would try curing a toothache by having his patient inhale smoke, because he was convinced that worms got in the tooth and caused the pain. Fumigating the teeth with smoke would kill the worms and relieve the pain.

The early Chinese used arsenic to cure a toothache. It worked to a degree, because it killed the pulp of the tooth, but the surrounding tissue would usually be damaged, which all too often led to an abscessed tooth. The dentists in this country, as late as 1850, also used arsenic to kill the pulp before they extracted the tooth.

Aristotle was one of the earliest, if not the first, to associate sweets with tooth decay. "Figs and soft sweets," he said, "produce damage to the teeth, because small particles adhere between the teeth where they very easily become the cause of putrefaction processes."

The Etruscans, who lived in Central Italy from 1000 B.C. to 400 B.C., were the most advanced of all the ancients in the art of mechanical dentistry. That is, they were very advanced in making crowns, bridges and false teeth.

Roman aristocrats practiced restorative dentistry for aesthetic rather than health reasons. They were interested in having false teeth to improve their appearance rather than as an aid to digestion.

Dentistry during the middle ages retrogressed from where it had been during the Roman and Etruscan times. Barber-surgeons became recognized as persons with the skill to shave a man's face, cut his hair, extract his teeth, and perform minor surgery.

Dentistry in this country has had its own unique but interesting history. The Plymouth Colony brought the first dentist (barber-surgeon) to America about 20 years after the first pilgrims arrived. His name was W. Dinley, and shortly after his arrival he perished in a snowstorm as he was traveling to Roxbury (now a part of Boston) to pull a tooth for a patient.

In April 1768, Dr. John Baker, who was one of the first competent dentists to practice in this country, left Boston and went to New York. His advertisement in the New York Journal claimed he could cure scurvy, fill hollow teeth with lead or gold, and make false teeth that looked as good as a person's natural teeth.

While it was true that the dentists of that time were using lead and gold foil to fill teeth, the procedures were painful and far from satisfactory. His claims of making "artificial teeth" were greatly exaggerated and, by today's standards, highly misleading. False teeth at that time were made from ivory, and they neither fit well nor looked as nice as natural teeth.

One of our most famous revolutionary war heroes, Paul Revere, was a dentist. In one of his advertisements that he placed in the Boston Gazette, he claimed that he could also make false teeth that looked as good as natural teeth, and they wouldn't hinder a person's speech.

The most famous false teeth in American history were those worn by our first president, George Washington. He had several sets of false teeth, but none were made from wood, rather they were all made from ivory.

The world's first dental school opened its doors in 1840, in Baltimore, Maryland. Up until then dentists got their training through an apprenticeship program, supplemented with whatever dental books were available. They had no background or knowledge of anatomy, pathology, or other related sciences.

It took many years for the idea of a dental school to take hold. The changes in dental education were slow and gradual, but eventually the profession realized that a higher quality of training could be attained at a dental college rather than through an apprenticeship program.

Today all dentists must graduate from a dental college, then pass a state licensing examination before they can practice dentistry. Dentists are doing things that the dentist of the past could only dream about. Today's dentists are doing a much better job of repairing (restoring) teeth. They can treat and cure gum disease, straighten crooked teeth, and aid in the prevention of dental disease.

Discussion questions:

A. Describe what it would be like to go to a dentist who lived 150 years age.
B. Why is education so important to today's dentists?
C. Are we doing things today that people living 50-100 years from now will find strange? Why?
D. For the first time in history we can prevent dental disease. Explain how. (Answer: Brush, floss, and use fluoride daily, eat sugary snacks only with meals, and visit the dentist regularly for an exam, fluoride treatment and sealants.)
E. Are you aware that the best dentists that ever lived are alive today? Explain why?

10-B. GEORGE'S TEETH

Objective: The student will develop an appreciation for dental history.

Grade Level: 2-6 **Materials/Preparation:**
None

Procedures:

1. Read or share the following, defining the vocabulary as you go.

At the time of George Washington's inauguration all of his natural teeth, except for one lower molar, had been lost. His dentures (which were ivory, not wood) were made to fit over this only molar, which also acted as an anchor. Sometime later during his presidency this last tooth was also lost.

During his lifetime, George Washington suffered many toothaches, and when the pain became unbearable his dentist would cure it by pulling the tooth. In those days the dentists didn't have the skills or knowledge to repair teeth nor could they deaden the pain when they pulled them.

In the late 1700's and early 1800's dentists started experimenting with tooth transplants. A dentist would approach a poor person (who had a nice set of teeth) and offer to buy a tooth. He would pull it and then try transplanting it in the mouth of a wealthy client. Unfortunately, it didn't last for long, but it did create unnecessary dental problems for the person who sold the tooth.

Today, our dentists are more capable of meeting our dental needs. For example, teeth can be straightened, cavities can be filled, gum disease can be prevented and cured, tooth decay can be prevented, painful teeth can be repaired without much pain and other dental procedures can be done as they are needed.

A hundred years ago the dentist didn't have this kind of skill, and although they were sincere in their efforts their methods usually resulted in the loss of a tooth. Today, more than half of the people in the United States over age 65 have lost all of their teeth, but this proportion is steadily declining. Now our dentists are involved in saving teeth, and if we do our part our teeth will last us a lifetime.

2. Discussion Questions:

   A. If George Washington lived today do you think he would still need false teeth, or do you think he could keep his teeth?

   B. If you could choose your dentist, would you choose the dentist that worked on George Washington's teeth or would you keep the one you are now going to? Why?

   C. What are some of the things you can do to help the dentist take care of your teeth?

Extensions:

1. Have the students ask an elderly relative or neighbor about their dental experiences as a child. Share the stories in class.

10-C. WHY TOOTHPASTE?

Objective: The student will develop an appreciation for modern dental practices and procedures.

Grade Level: 3-6 **Materials/Preparation:**
Old Magazines

Procedures:

1. Review reasons for brushing teeth. Ask students what kind of toothpaste or powder they use and why. Lead to the conclusion that toothpaste with fluoride is essential for the prevention of tooth decay.

2. Assign students to collect magazine and newspaper ads for toothpastes and tooth powders. Look for half-truths and false statements in the ads.

3. Have a team of student investigators visit a supermarket and list all brands, types and costs of toothpaste and tooth powder. Note which have the seal of approval of the American Dental Association. Discuss the findings with the class.

Extensions:

1. Plan a program to share the results of the above activities with other classrooms.

2. Devise a mock TV show for lower grades about fake advertising of dental products.

The Toothpaste Recipe

22 grams	Calcium Carbonate
14 grams	Calcium Phosphate
01 gram	Castile Soap
01 bottle	Corn Syrup
08 grams	Powdered Sugar
01 drop	Oil of peppermint or oil of cinnamon
01 drop	Food Coloring (red or green)

Mix calcium carbonate, calcuim phosphate, and soap together. Gradually add 1/4 tsp. of syrup. Add powdered sugar and one drop of oil. Add 1 drop of food coloring.

Materials Needed: eye dropper, cup and tongue depressor (for mixing), small vial for measure, balance for weighing, weighing paper. Contact a pharmacist for ingredients.

Note: This does **not** contain fluoride.

TOPIC ELEVEN
DENTAL PROFESSIONALS

Program Goal 5.0: To develop an understanding of the importance of dental professionals.

Background Information

DENTISTS:

Dentists are specialists trained in the science of prevention, diagnosis and treatment of diseases of the oral cavity. Dentists receive usually four, but at least two years, of undergraduate college and four years at an accredited dental school. Besides holding a Doctor of Dental Surgery (DDS) or Doctor of Dental medicine (DMD) degree, dentists must be licensed in the state where they practice.

Dentists may be general practitioners or receive additional training in a specialty field. General practitioners must be proficient in many areas of dentistry, whereas the specialists devote their time and skills to specific dental problems. The following are the eight recognized dental specialists:

Endodontist: Specializes in diagnosis and treatment of diseases of the dental pulp, the center of the tooth which is make up of nerves, blood vessels, and connective tissue. Fills root canals.

Oral and Maxillofacial Surgeon: Specializes in diagnosis in injuries, diseases and malformations of the oral cavity. Performs extraction of impacted wisdom teeth and other complex surgical procedures.

Oral Pathologist: Specializes in the study of the nature of diseases of the mouth through laboratory or clinical diagnosis. Helps other dentists to diagnose difficult cases.

Orthodontist: Specializes in the treatment, and where possible, prevention of abnormal alignment of teeth and jaws. Puts on braces.

Pedodontist: Specializes in preventing and treating mouth conditions which arise during childhood and early adolescence. A children's dentist.

Periodontist: Specializes in prevention and treatment of diseases of the supporting tissues surrounding the teeth. Treats gum disease.

Prosthodontist: Specializes in replacing missing natural teeth and related structures with fixed or removable substitutes, such as full or partial dentures.

Public Health Dentist: Specializes in the control and prevention of dental disease and the promotion of oral health through organized community efforts. Usually, these dentists are employed by a government agency.

While most dentists in the United States work in private practices, dentists may also practice in schools, hospitals, institutions, state and local health agencies, the armed forces, or in other federal government agencies.

Other members of the dental health professional team who assist the dentist are the dental hygienist, the dental assistant and the dental laboratory technician.

THE DENTAL HYGIENIST

The dental hygienist is an oral health educator and clinical operator. Dental hygienists are trained to use scientific methods to control and prevent oral diseases. They also aid individuals in attaining and maintaining optimum oral health.

To practice, a dental hygienist must graduate from an accredited four-year college program offering a bachelor of science degree or an accredited two-year program leading to dental hygiene certification. They must also be licensed by the state where they practice.

The following are some of the services a dental hygienist may provide in Kentucky: oral prophylaxis, which is the removal of calculus, plaque and stain from tooth surfaces; teaching proper oral health home care; application of topical fluorides; nutritional counseling and taking of dental x-rays.

Besides working in a private dental practice, a dental hygienist may also work in hospitals, nursing homes, state or local health departments, the armed services or in local school programs.

DENTAL ASSISTANT

A dental assistant is an important member of the dental health team. A dental assistant may be trained in the dental office or attend a one to two-year special school. A well-trained dental assistant is always one step ahead of the dentist allowing the dentist's work to flow smoothly. Dental assistants perform many functions, including assisting the dentist at the dental chair by preparing instruments and materials, taking dental x-rays, acting as office managers who keep records, order supplies and schedule appointments for the patients.

DENTAL LABORATORY TECHNICIAN

A dental laboratory technician constructs and repairs dentures, crowns, bridges and gold inlays. This service is performed under the authorization of a licensed dentist. Dental laboratory technicians may have one or two years of special training or have on the job training. A good dental laboratory technician is considered a skilled craftsman who is an invaluable asset to the dentist.

11-A. THE DENTIST COMES TO SCHOOL

Objective: The student will recognize dental professionals as a source of help involving tooth problems.

Grade Level: K-6 **Materials/Preparation:**
None

Procedures:

1. Invite a guest to come to class to explain the role of dental professionals in preventing and solving teeth problems. Your guest could be a dentist, dental hygienist, or dental assistant. In the following discussion, let us assume that your guest is a dentist, Dr. John Smith.

A. Don't expect Dr. Smith to teach your entire dental health unit with a 30 or 40 minute presentation. It can't be done and it shouldn't even be attempted.
B. When making arrangements for a guest to come, give him/her a specific topic to speak on, such as brushing and flossing, fluoride, sealants, or what a dentist does, then integrate the presentation into your dental health unit.
C. A few days before Dr. Smith comes to your class spend some time preparing your students for his visit by teaching some dental health. Thus, Dr. Smith can reinforce the concepts you have already taught.
D. Perhaps your students are usually better behaved in the morning and their attention span is longer then. If it fits Dr. Smith's schedule, try for a morning presentation.
E. Before introducing Dr. Smith, visit him for a moment and find out how he would like to be introduced. For example, does he want the formal introduction, "This is Dr. Smith," or would he prefer to be called, "Dr. John?" If he doesn't have a preference, introduce him as Dr. Smith. Get his name and title correct.
F. Always introduce your guest. Never ask hem to introduce himself or to tell a little about himself. If you want to know more about your guest, then ask and share the information with your class.
G. Don't expect Dr. Smith to be a disciplinarian. It is your responsibility to keep the class under control by disciplining those students that are restless and beginning to misbehave. This is important if Dr. Smith is to be glad he came.
H. Don't leave Dr. Smith in the classroom by himself. Stay and listen.
I. Give Dr. Smith your undivided attention. Don't correct papers or work on other things while he is speaking. If other classes are invited, then the other teachers should also extend the same courtesy.
J. Have your students write thank-you notes and send them to Dr. Smith. With these suggestions to follow, plus your own warm and friendly personality, your quest speaker on dental health will be happy to come again next year.

Extensions:

1. Arrange a field trip to a local dental office for the purpose of being introduced to the latest innovations in dental equipment and procedures.

11-B. THE DENTIST DOESN'T DO IT ALONE

Objective: The student will recognize dental professionals as a source of help in solving tooth problems.

Grade Level: 2-5 **Materials/Preparation:**
1 worksheet

Procedures:

1. Begin the activity by asking, "Does the dentist have any helpers?" Identify the following:

   Dental assistant
   Dental Hygienist
   Dental laboratory technician

2. Conclude the activity by emphasizing that the patient is the dentist's biggest helper in preventing tooth decay.

Dental Hygienist

A dental hygienist is an important member of the dental health team. A college degree and a license is required to be a dental hygienist.

People should know how to brush their teeth properly and how to care for them in other ways. A dental hygienist can teach them to do this and also clean their teeth professionally.

Fluoride and sealants can be applied to teeth by a dental hygienist. The dental hygienist also takes x-rays to see if there are problems with the teeth or the surrounding structures.

A dental hygienist also talks to parents and teachers about teeth and plans special programs for the classroom.

Dental Assistants

A dental assistant works in the dentist's office. Some dentists teach assistants what to do in their office, but there are also special schools to attend to acquire the skills of a dental assistant.

The dental assistant helps the dentist while he is working on the patient. A dental assistant also sterilizes all the instruments and prepares them for the dentist to use. Dental assistants may answer the phone, make appointments, greet patients, and prepare them for any necessary treatment that is needed.

The dental assistant or the office manager orders all the supplies, and handles the business end of things such as keeping records, billing patients, and filling out insurance forms.

Dental Laboratory Technicians

A dental technician works in a laboratory making crowns, bridges, and inlays as ordered by the dentist. A dental technician makes partial and complete dentures (false teeth) also.

The work a dental laboratory technician does must be exact. Training comes from special schooling and then assisting in a lab as an apprentice to learn how to do the work. The teeth, or parts of teeth that are made, must fit the patients mouth exactly and be the right color to provide for good health and an improved personal appearance.

11-C VISIT TO THE DENTIST- ROLE PLAY

Objective: The student will conclude that the dental health team can help prevent many future problems.

Grade Level: 2-6 **Materials/Preparation:**

When the children act out the various role play situations, care should be taken to ensure that they portray the visit to the dentist as a positive experience. They should be helped to understand that they don't need to be afraid of the dentist and that he/she is their friend who is only interested in helping them.

Procedures:

1. By having the students role play a trip to the dentist, they gain a better understanding of what a dentist does and how he/she helps their teeth. These role play situations can also be used to help the children realize that the dentist is their friend and they should not be afraid of visiting him. Introduce the activity by assigning the following situations to groups of students. Give them preparation time. Then share and discuss each situation.

A. Have a child go to the dentist for a dental exam. The dental assistant will welcome you to the office. The dentist takes an X-ray and does a visual exam. The dental hygienist cleans the child's teeth and gives him a fluoride treatment. The dentist then checks for cavities using the developed X-rays.
B. Have a second child visit the dentist for an exam. The dentist does everything in the above example, but also finds a cavity and repairs it.
C. Another child enters the dental office with a toothache. The dentist repairs it and the child leaves happy.
D. A boy knocked out his front tooth in a football accident. He picked the tooth up, rinsed it off, placed it is a glass of milk, an took it to the dentist who was able to put it back in the boy's mouth and possibly save the tooth.
E. A child needing braces went to the orthodontist to have them put on. He has to go back and have them adjusted, usually once a month.
F. Have a student act as a dentist by teaching the class how to brush and floss properly.

2. Distribute the Tools Of The Dentist worksheet and discuss the function of the various tools used by the dentist.

Extensions:

1. Provide information on careers related to dentistry.

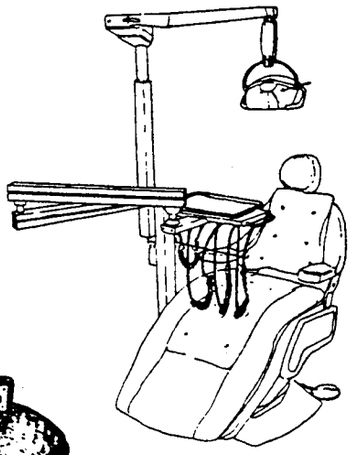
2. Set up a bulletin board display related to dentists and dentist's helpers. Include toothbrush pictures, ads, pretty smiles, etc.

3. Have a "Visit to the Dentist" poster contest.

WORKSHEET: Tools Of The Dentist

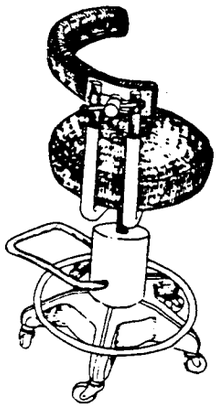
NAME_____

Scissors



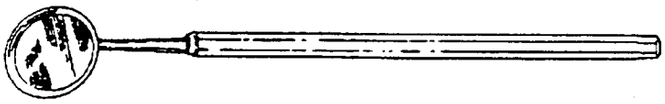
Dental Chair

Hand Piece (Drill)



Dental Stool

Mirror



Explorer

Amalgram Carrier

APPENDICES

Appendix I: Glossary of terms

Appendix II: Kentucky Dental Health Programs

Appendix III: Dental First Aid for School Nurses

APPENDIX I

Glossary of Dental Terms

Abrasion: The wearing down of the teeth due to friction or improper chewing.

Abscess: A collection of pus in the tissues, usually due to infection by bacteria.

Acid: A chemical substance which forms in the mouth from bacterial action. This acid causes tooth decay.

Alveolar bone: The cavity or socket in which the root of the tooth is held by the periodontal ligaments.

Amalgam: Alloy usually of silver, tin and mercury used for filling teeth.

Anterior teeth: The front six teeth in the mouth.

Arch: A term used to designate the upper or lower teeth collectively.

Assistant: A Person who performs various supportive tasks in the dental office to assist the dentist.

Bacteria (germ): A large group of typically one-celled microorganisms, many of which are disease producing.

Bicuspid (premolar): A permanent tooth with two points or cusps

Bridge: A prosthetic appliance replacing missing teeth, held in place by attachment to adjacent teeth.

Calcium: Metallic basic element of lime essential to the formation and growth of teeth.

Calculus (tartar): A hard deposit of mineral salts from the saliva found on the surface of the teeth.

Carcinogen: Any cancer-producing substance.

Caries (tooth decay): Localized disease process which destroys the structure of a tooth and produces a cavity.

Cariogenic: A substance that has the ability to produce dental caries.

Cavity: Hollow place or hole caused by decay in a tooth.

Cementum: The bony substance which forms the outer layer of the root of a tooth.

Chaw: A wad of tobacco which the chewer places in their mouth.

Crown: (1) The part of the tooth that is covered with enamel and is normally above the gums.

(2) A gold, porcelain, stainless steel or plastic replacement for the natural crown of the tooth.

Cuspid (canine): An anterior tooth with one point or cusp shaped for tearing food.

Decalcify: To remove calcium salts from bone or teeth.

Decay: To become decomposed, as when a tooth decalcifies.

Deciduous teeth (primary): The first set of teeth developed by a child, baby teeth, twenty in number.

Dentifrice (toothpaste or powder): Cleansing substance for the teeth which should contain fluoride.

Dentin: The hard, dense calcified tissue which forms the body of the tooth underneath the enamel.

Dentistry: A healing arts profession which is concerned with the teeth, oral cavity, and associated parts including the diagnosis, treatment and prevention of their diseases and the restoration of defective and missing tissue.

Dentures: A set of artificial teeth.

Enamel: The smooth, hard, calcified, outer coating of the teeth. Enamel is the hardest natural substance in the body.

Eruption: The natural passage of a tooth through the gum into the oral cavity.

Extraction: The act of removing a tooth.

Filling: A material such as gold, amalgam, or plastic inserted in a prepared cavity in a tooth.

Floss: A strong thin thread used to clean areas between the teeth.

Fluoridation: The adjustment of the fluoride content in the public water supply to reduce tooth decay.

Fluoride: A compound of fluoride, when properly used will reduce tooth decay.

Gingiva: The gum, or tissue, which covers the alveolar bone of the upper and lower jaw and surrounds the necks of the teeth.

Hygiene, Oral: Cleanliness or proper care of the mouth and teeth.

Hygienist: A professional that provides certain specified services such as prophylaxis (cleaning the teeth), and educating the public in good dental health practices.

Impacted Tooth: The condition in which a tooth is embedded in the alveolar bone and/or soft tissue so that its eruption is prevented.

Incisor: Any one of the four front teeth of either upper or lower jaw, shaped for biting and cutting food.

Lateral Incisor: Tooth next to the central incisors in both jaws

Malocclusion: Irregularity of tooth position and poor fitting together on closing the jaws.

Mandible: Lower jaw.

Mastication: The act of chewing.

Maxilla: Upper jaw.

Molar: Teeth adapted for grinding, in the back of the jaw.

Nerve of Tooth: Nerve fiber found in the pulp which supply teeth with sensation from the central nervous system.

Orthodontic appliance: A device used to guide teeth into proper position.

Partial denture: An appliance to replace less than the full number of teeth in the jaw.

Patient: A person who is undergoing preventative or restorative treatment for a disease.

Periodontal disease: Disease affecting the soft tissues (gums), the periodontal ligaments holding the teeth in place, or the bone surrounding the teeth.

Periodontal ligament: A layer of tissue made up of tiny fibers which help hold the tooth in its socket.

Permanent teeth: The second set of teeth, 32 in number which follow the primary teeth into the mouth.

Pit: A small indention in the crown of a tooth.

Plaque: A thin, tenacious, film like deposit made up of protein substances and microorganisms which adheres to the tooth.

Prophylaxis: The professional cleaning of teeth by a dentist or a dental hygienist, where by extraneous materials, including stain, plaque and calculus are removed.

Prosthetic appliance: A replacement for missing teeth or tissue; often used in repairing cleft palate, etc.

Protrusion: Projection, usually of the upper front teeth, often resulting in a malocclusion.

Pulp chamber: The chamber in the center area of the tooth which is filed with blood vessels, nerves and connective tissue.

Quid: A small portion of any smokeless tobacco which is held in the mouth for dipping (snuff) or chewing (leaf or plug).

Root: Part of tooth which is normally beneath the gums and anchors the tooth in the jawbone. It is covered with cementum.

Root Canal: Passageway for blood vessels and nerves through the tooth.

Saliva: The clear alkaline secretion from the salivary glands.

Sealant: A plastic-like resin placed on the biting surfaces of back teeth to prevent cavities.

Smokeless tobacco: Chewing tobacco or snuff, used by placing leaf tobacco, plug tobacco or powdered tobacco in the oral cavity between the cheek and gum.

Snuff dipping: The placing of a pinch of powdered tobacco between the cheek and gum.

Sodium Fluoride: A chemical combination of sodium with fluoride. The active ingredient found in fluoride toothpastes and mouthrinses.

Space maintainer: Appliance inserted in place of a missing primary tooth to prevent teeth from drifting, until the eruption of a permanent tooth.

Stannous fluoride: A chemical combination of tin and fluoride. The active ingredient found in some fluoride mouthrinses.

Streptococcus mutants: Bacteria found in plaque which produce decay-causing acid from fermentable carbohydrates.

Systemic fluoride: Fluoride which is swallowed and if taken in appropriate amounts daily from birth to age 14, will become part of the developing teeth, resulting in enamel more resistant to decay.

Tartar: The layman's term for calculus.

Topical fluoride: Fluoride which is placed on the teeth by the dentist or hygienist to give a degree of protection from decay to the teeth.

Wisdom tooth: Third permanent molar in each jaw.

X-ray (radiograph): A film showing images of structures lying within the tooth and bone, used as an aid to diagnosis and treatment.

APPENDIX II

Kentucky Dental Health Programs

Kentucky Cabinet for Human Resources
Dental Program

DENTAL HEALTH PROGRAM
DEPARTMENT FOR HEALTH SERVICES

Dental disease is the leading chronic disease in Kentucky, affecting 90% of our total population, but it is the most preventable of all human illnesses. We have the knowledge and techniques to wipe out most dental disease, especially in Kentucky's children.

Concerned, dedicated people across the state work together to make Kentucky a leader in the prevention of dental disease.

Kentucky's Dental Health Program services include the following:

Community Fluoridation: Fluoride is a natural, essential nutrient and the best tooth decay-preventing substance ever found to keep teeth strong and healthy for a lifetime. Fluoridation of community water systems can reduce new tooth decay by 40-50%. For every dollar spent on community water fluoridation, $50.00 of dental treatment can be avoided. About 90% of Kentucky citizens are now served by a fluoridated community water system.

Rural School Fluoridation: In rural areas where there is no public water supply and where home drinking water does not contain enough natural fluoride, fluoridation of school water can reduce tooth decay in children by about 25-35%. The Dental Program provides fluoridation units to the rural schools that need this service. Conservatively, there is a savings of $10.00 in dental treatment costs for each dollar spent on school fluoridation.

Fluoride Supplements: Fluoride supplements can provide protection to the preschoolers who do not have fluoridated drinking water at home. Supplements can prevent up to 40% of the decay they would normally have by age six thereby producing a savings of $15.00 in treatment costs for each dollar spent. The supplemental comes in two forms -- drops and chewable tablets. The Dental Program provides supplements free of charge through local health departments, private practicing dentists and physicians.

School Fluoride Mouthrinse: School children in grades one through six rinse with a fluoride solution each week for 28 weeks during the school year. The results are a 20-25% reduction in new dental decay when used during those years. This creates a savings of $5.00 in dental care for each dollar spent on the program.

Dental Health Education: Dental health education stresses individual responsibility for good oral health and helps young children develop good habits for a lifetime. Resource material is available upon request from the Dental Program.

For more information about Dental Health in Kentucky contact:

Robert Fowler, Jr., D.M.D.
Dental Health Program Administrator
Maternal and Child Health Division
Department for Health Services
Frankfort, KY 40621

Phone: (502) 564-3246

APPENDIX III

DENTAL FIRST AID GUIDE

University of Kentucky
College of Dentistry

UK Chandler Medical Center, Lexington, KY 40536-0084
(1-800-28-UK-DMD)

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Introduction

This flipchart is designed to aid school nurses, teachers, and parents in the effective treatment of minor dental emergencies. Although the first aid procedures should provide temporary relief, they cannot always solve the dental problem. Please be sure to consult with a dentist as soon as possible.

Dental First Aid Supplies

The following should be added to your first aid kit, to be used for dental emergencies.

Medications

Salt
Hydrogen peroxide solution (3%)
Aspirin substitute*
"Orabase with Benzocaine"*

*Medications cannot be used in schools without written approved protocols specific to each drug and signed by a physician or dentist. The protocol will include: name of drug, indications, contraindications, side effects, and dosage specific to age level.

Special Note: Aspirin should be avoided in children with fever because of the possible association with Reye's Syndrome.

Basic Supplies

Cotton
Cotton swabs
Sterile gauze square (2" x 2")
Sterile gauze pads
Tea bags
Toothbrushes
Dental floss
Stimudents or toothpicks
Tweezers
Paraffin or candle wax
Ice pack or wet frozen washcloth

Inflamed or irritated gum tissue

- Red, swollen or sore gums should be rinsed thoroughly with a warm salt water solution (1/2 teaspoon of salt in a glass of warm water). Another mouth rinse can be made by mixing equal parts of water and a 3% solution of hydrogen peroxide. Either of these mouth rinses should be swished around the entire mouth for several seconds.
- Inflamed, bleeding gum tissue can be the result of poor oral hygiene. Diligent removal of plaque by brushing and flossing daily will allow the gums to regain healthy tissue and tone. Toothpaste does not have to be used to remove the plaque - baking soda, salt, or hydrogen peroxide (dilute 3% solution) can be used with a soft bristle toothbrush, and dental floss can be used to remove plaque and aid in maintaining healthy gums. The use of a toothbrush, coated only with saliva, has also been shown to be effective in plaque removal/control.
- Bleeding gums may also be caused by a Vitamin C deficiency or a systemic problem. If the condition does not improve with good oral hygiene (brushing 3-4 times a day and flossing at least once a day), a diet evaluation may be in order. Recommend to the parent that a dentist be consulted.
- An injury (trauma) to the mouth can cause the gum tissue to swell and bleed. The gums and teeth should be kept clean to decrease the chance of infection. A cold compress may be applied to the area from the outside of the cheek to help control swelling. Using a sterile 2" x 2" gauze square, apply direct pressure to the injured gum or cheek to control the bleeding.

Fever blisters, cold sores and canker sores

- Apply "Orabase with Benzocaine*" for temporary relief (in moderate amounts).
- Spicy and "acidy" foods should be avoided.
- Aspirin substitute* may be given for pain or fever (dosage according to child's weight and age). Never place the tablet on the sore as this will cause a chemical burn to the tissue.
- Recommend to parent that they consult a dentist if pain or fever persists.

**See medications note under "Dental First Aid Supplies."*

Toothache

- Rinse the mouth vigorously with warm water to clean out any debris.
- Use dental floss to remove any food trapped in the cavity.
- If swelling is present, apply a cold compress to the outside of the cheek. Do not use heat.
- An aspirin substitute* may be given to relieve pain (dosage according to child's weight and age).
- Do not place the tablet on the gum tissue or on the aching tooth as it will cause chemical burns to the tissues.

**See medications note under "Dental First Aid Supplies."*

If a child has a toothache or other apparent dental emergency, the child's parents should be contacted. If the child has a private dentist, he or she should be referred to that dentist as soon as possible.

Note: The state dental association or local dental society can be contacted. Through their referral service, the names of dentists who are willing to accept emergency patients and practice in the area can be given to the family.

Other resources: The University of Kentucky College of Dentistry, hospitals with dental emergency facilities, public school dental clinics, local health departments with dental facilities and other community dental clinics.

Prolonged or recurrent bleeding after an extraction

The child should be instructed not to rinse or swish at all for 24 hours after an extraction (having a tooth pulled), as this could wash out the blood clot forming at the extraction site. Normal drinking is permissible; however, straws should not be used for 24 hours because the suction created in the mouth could dislodge the blood clot.

Do not be alarmed if there seems to be a lot of blood oozing from the extraction site. Remember that the blood is mixing with saliva and, therefore, it may appear there is more bleeding than is actually the case. If the bleeding is determined to be more than oozing or is alarming the child, the following is recommended:

- Place a sterile gauze 2" x 2" on the extraction site, and have the child bite on it for about 30 minutes. Replace soaked gauze 2" x 2" pads with clean ones as necessary.
- If the bleeding persists, wrap a moistened tea bag in a sterile gauze 2" x 2" and have the child bite on it for 30-45 minutes. Repeat this procedure if necessary.
- An aspirin substitute~ may be given for pain (dosage according to child's weight and age). Avoid aspirin as it reduces the blood's ability to clot.
- If bleeding cannot be controlled, or significantly slowed within 2 hours, contact the parent and recommend he/she consult a dentist.

**See medications note under "Dental First Aid Supplies."*

Broken or displaced teeth

- Try to clean the soil, blood, and other debris from the injured area with a sterile gauze or cotton swab and warm water.
- Apply a cold compress on the cheek next to the injured tooth to reduce swelling.
- Have the child gently bite his teeth together. Check for displacement of teeth. If possible, gently move the displaced tooth or teeth into their correct position.
- If the tooth has been pushed up into the socket or gum by the blow, do not attempt to pull it out into position. It will re-erupt normally on its own.
- If the broken tooth has created a sharp edge, it may be covered with paraffin (wax) to prevent tissue lacerations.
- An aspirin substitute* may be given for pain (dosage according to child's weight and age).
- Contact the parent and arrange to have the child taken to the dentist as soon as possible.

**See medications note under "Dental First Aid Supplies."*

Traumatic avulsion (loss of) permanent tooth

(Permanent tooth only)

- Look in the accident area for the tooth that was knocked out.
- If found, do not attempt to clean the tooth. Washing the tooth off could destroy the connective fibers which help anchor the tooth in the mouth.
- If the tooth has been on the ground, gently rinse off the tooth, do not wipe or rub it. Attempt to place the tooth into the socket before a blood clot forms in the socket. Check on patient's medical/dental history to see if the tetanus immunization is current. If not current, the child should be taken to the family physician within 24 hours for a booster injection. Tetanus (lockjaw) can be very serious. If the patient is not cooperative or if the school nurse or teacher is not comfortable with reinserting the tooth, place the tooth in a cup of milk, water or wrap it in a clean wet cloth or gauze.
- Contact the parent and arrange to have the child taken to the dentist immediately. Many times the tooth can be successfully reimplanted and saved. The sooner the better!
- An aspirin substitute* may be given for pain (dosage according to the child's weight and age).

**See medications note under "Dental First Aid Supplies."*

Possible jaw dislocation or fracture

- If a jaw fracture or dislocation is suspected, immobilize the jaw by any means available. Place a scarf, handkerchief, tie, or towel under the chin and tie the ends on top of the child's head.
- Contact the parent and arrange for child to be taken immediately to an oral and maxillofacial surgeon or hospital emergency room. At the hospital the child should be seen by an oral and maxillofacial surgeon, if available.

Orthodontic (braces) emergencies or problems

For irritation in the mouth caused by a protruding wire from orthodontic bands, the following procedures are recommended.

- A blunt item (tongue depressor, cotton swab, or pencil eraser) may be used to gently bend the wire so it is no longer irritating the soft oral tissues.
- When the protruding wire cannot be bent, simply cover the end of it with paraffin (wax), a piece of gauze, or a small cotton ball so it is no longer causing irritation.
- Do not attempt to remove any wire that is embedded in the cheeks, gum, or tongue. Contact the parents so that they can make an immediate appointment with the child's orthodontist.
- The placement and adjustment of orthodontic bands/wires can cause some discomfort for a few days. Some relief can be achieved by holding warm salt water (1/2 teaspoon of salt in a glass of warm water) in the mouth. Aspirin substitute~ can give additional relief (dosage according to child's weight and age). A semisolid diet is recommended until the mouth feels comfortable to resume normal chewing.
- If a wire or appliance becomes loose or broken and can be removed easily, contact the parent to take the child and the wire to the orthodontist immediately.

**See medications note under "Dental First Aid Supplies."*

Tooth eruption pain

- Try to determine if the pain is from a loose primary (baby) tooth pinching the gum tissue, or due to an erupting permanent tooth. Refer to the tooth eruption chart in this flipchart.
- Prolonged pain (more than one week) is unusual and may be caused by inflammation around an impacted or partially impacted tooth. This type of pain is usually intermittent and less painful than the type of pain associated with a badly decayed tooth. This periodic, prolonged pain is fairly common with eruption of first permanent molars and third molars or wisdom teeth. A dentist should be consulted.
- An aspirin substitute* can be given for the temporary relief of pain (dosage according to child's weight and age). Never place the aspirin directly on the tissue or tooth in the area of pain.
- A cold compress or a piece of ice wrapped in a 2" x 2" gauze square can be directly applied to the eruption site. Due to the numbing effect of the cold, this method can provide temporary relief.
- If the pain persists, contact the parent and recommend that a dentist be consulted.

**See medications note under "Dental First Aid Supplies."*

Lacerated lip or tongue

- Apply direct pressure to the bleeding area with a sterile 2" x 2" gauze square.
- If swelling is present, apply a cold compress (lip injury).
- If the bleeding does not stop within 30 minutes, or if the injury is severe, contact the parent to take the child to a hospital emergency room.

*See discussion of tetanus under "Traumatic avulsion" (page 8).

Objects wedged between teeth

- Try to remove the object with tweezers or dental floss. Remember to guide the floss in gently (against teeth) so as not to injure the gum tissue.
- Do not try to remove the object with a sharp or pointed tool/instrument.
- If unsuccessful, contact the parent to take the child to the dentist.

TOOTH ERUPTION CHART

REMEMBER THAT SOME CHILDREN'S TEETH ERUPT MUCH EARLIER AND SOME MUCH LATER THAN THE AVERAGE ERUPTION DATES GIVEN HERE. A YEAR ON EITHER SIDE OF THE AVERAGE ERUPTION TIMES IS NOT UNUSUAL.

ERUPTION AND SHEDDING OF THE PRIMARY TEETH (BABY TEETH)

Upper Teeth	**Eruption**	**Shedding**
Central incisor	7½ mos.	7½ yrs.
Lateral incisor	9 mos.	8 yrs.
Cuspid	18 mos.	11½ yrs.
First molar	14 mos.	10½ yrs.
Second molar	24 mos.	10½ yrs.
	Lower Teeth	
Second molar	20 mos.	11 yrs.
First molar	12 mos.	10 yrs.
Cuspid	16 mos.	9½ yrs.
Lateral incisor	7 mos.	7 yrs.
Central incisor	6 mos.	6 yrs.

ERUPTION OF THE PERMANENT TEETH

Upper Teeth	
Central incisor	7-8 yrs.
Lateral incisor	8-9 yrs.
Cuspid	11-12 yrs.
First bicuspid	10-11 yrs.
Second bicuspid	10-12 yrs.
First molar	6-7 yrs.
Second molar	12-13 yrs.
Third molar	17-21 yrs.
Lower Teeth	
Third molar	17-21 yrs.
Second molar	11-13 yrs.
First molar	6-7 yrs.
Second bicuspid	11-12 yrs.
First bicuspid	10-12 yrs.
Cuspid	9-10 yrs.
Lateral incisor	7-8 yrs.
Central incisor	6-7 yrs.